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U.S. Department
of Transportation

National Highway
Traffic Safety
Administration

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September 1984

Final Report

Side-Impact Aggressiveness Attributes Car-To-Pole Side Impact Test of a 45° Crabbed Moving 1977 Volkswagen Rabbit Into a Fixed Rigid Pole at 25.0 Mph



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16. Abstract This test report documents a pole crash test conducted under NHTSA Contract DTNH22-82-A-08401, Task Order SRL 92 entitled, "Side Impact Aggressiveness Attributes". Testing was conducted on a 1977 Volkswagen Rabbit 2-door hatchback at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was structurally modified to the level designated "Optimized" and also contained additional padding on the driver door and the left rear occupant wall. The test vehicle was towed into a fixed, rigid pole, crabbled at a 45 degree angle with a velocity of 25.0 mph. The impact point was 9.0 inches forward of the vehicle wheelbase centerline. Vehicle accelerations were measured, along with occupant responses of two side impact dummies. One dummy was located in the driver's designated seating position and one was located in the left rear passenger position. The test date was August 16, 1984 and the ambient temperature was 82° F.					
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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The purpose of this crash test was to assess occupant safety when a vehicle impacts a pole at a 45° angle, 9 inches forward of the vehicle wheelbase centerline. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A modified 1977 Volkswagen Rabbit 2-door hatchback was towed into a fixed, rigid pole on August 16, 1984, with the driver's side of the car leading at a 45° angle. The intended test speed and impact point were 25 mph and 9 inches forward of the wheelbase centerline respectively. Actual impact velocity was 25.0 mph and the actual impact point was 9.0 inches forward of the wheelbase centerline. This test was conducted to assess occupant safety under the previous stated impact conditions.

The vehicle was structurally modified to the level designated "Optimized". The driver door and left rear occupant wall contained additional padding.

The General Test and Vehicle Parameter Data are contained in Section 2. Section 3 contains all data required by R & D. Pre-test and post-test vehicle and dummy photographs are found in Appendix A. Appendix B contains all Data Plots.

SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagenwerk AG

MAKE/MODEL: Volkswagen Rabbit

VIN: 1773372227

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1977

NHTSA NO.: R & D

COLOR: Silver Green

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 97 CID

TRANSMISSION DATA: 4 Speed Manual

DATE VEHICLE RECEIVED: 7/9/84

ODOMETER READING: 14800

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING No
POWER BRAKES Yes
POWER SEATS No
POWER WINDOWS No
TINTED GLASS No
RADIO Yes
CLOCK Yes
OTHER

AUTOMATIC TRANSMISSION No
AUTOMATIC SPEED CONTROL No
TILTING STEERING WHEEL No
TELESCOPING STEERING WHEEL No
AIR CONDITIONING No
ANTI-SKID BRAKE No
REAR WINDOW DEFROSTER Yes

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? No, structurally optimized modification.
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Fair

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST: NA

VEHICLE MANUFACTURED BY:

DATE OF MANUFACTURE:

GVWR: LBS.,

GAWR: FRONT LBS., REAR LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 35 psi; REAR 35 psi

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Michelin XZX 155 SR 13

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	600	LBS.	RIGHT REAR	370	LBS.
LEFT FRONT	660	LBS.	LEFT REAR	360	LBS.
TOTAL FRONT WEIGHT	1260		LBS. (63.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	730		LBS. (36.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1990		LBS.		

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 25 1/4	;LF 24 7/8	;RR 24 1/2	;LR 24 1/4
PRE-TEST ATTITUDE:	RF 24 3/4	;LF 23 9/16	;RR 21 1/2	;LR 20 3/4
POST-TEST ATTITUDE:	RF 25 5/8	;LF 23	;RR 20 11/16	;LR 20 15/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 262 LBS. CARGO:

RIGHT FRONT	610	LBS.	RIGHT REAR	625	LBS.
LEFT FRONT	770	LBS.	LEFT REAR	610	LBS.
TOTAL FRONT WEIGHT	1380		LBS. (52.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1235		LBS. (47.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2615		LBS.		

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: NA GALLONS

TEST VOLUME: 3.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 10.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: Yes

FUEL INJECTION: Yes

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? No

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 psi; REAR 27 psi

RECOMMENDED TIRE SIZE: 155 SR 13 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Front - Bucket
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT
2 REAR

CARGO LOAD 262 LBS. 4 TOTAL

TOTAL 862 LBS.

*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

TEST CONDITIONS

TEST NUMBER: 840816

DATE OF TEST: August 16, 1984

TIME OF TEST: 12:30

WIND VELOCITY: 4-8 mph 333° NW

HUMIDITY: 35 %

AMBIENT TEMPERATURE AT IMPACT AREA: 82° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 80° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2615	2600
VEHICLE VELOCITY (MPH)*	25.0	25.0
IMPACT POINT (INCHES)**	9.0	9.0

DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:	SID			SID	
SERIAL NO.:	06			U02	
INSTRUMENTATION:					
HEAD ACCEL.:	Yes			Yes	
CHEST ACCEL.:	Yes (Upper/Lower)			Yes (Upper/Lower)	
FEMUR L.C.'S:	No			No	
OTHER:	Pelvis/Ribs			Pelvis/Ribs	
RESTRAINT SYSTEM:	Both dummies were unrestrained				

* As measured over final one foot of travel.

** As measured forward of the midpoint of the vehicle's wheelbase.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER 06	PASSENGER U02
Head	<u>Side Window, Windshield, Pole</u>	<u>Side Header, Side Window</u>
Chest	<u>Driver's Inner Door Panel</u>	<u>Inner Quarter Panel, B-Pillar</u>
Abdomen	<u>Driver's Inner Door Panel</u>	<u>Inner Quarter Panel</u>
Left Knee	<u>Driver's Inner Door Panel</u>	<u>Inner Quarter Panel</u>
Right Knee	<u>Left Knee</u>	<u>Left Knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>DNA*</u>	<u>Tools Required</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>Yes</u>	<u>Yes</u>
Rear	<u>No</u>	<u>No</u>

GLAZING DAMAGE:

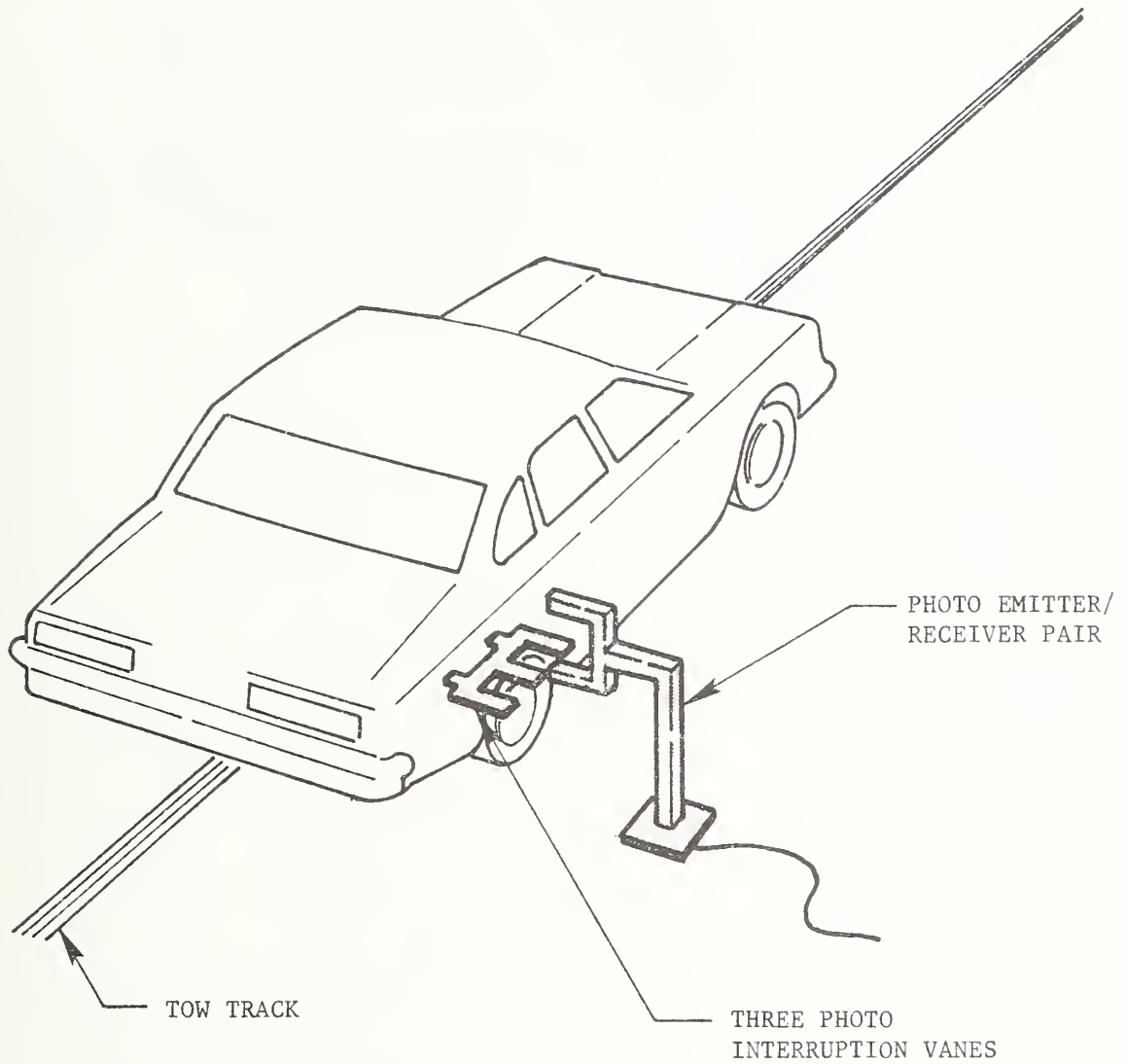
Left rear window fell out, left front window shattered.
Windshield cracked, possibly from impact of dummy's
head.

OTHER NOTABLE IMPACT EFFECTS:

Driver's seat rotated approximately 45° counter-clockwise.

*The driver's door was to remain closed for subsequent door opening effort studies.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies X 174 lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 1990 + 2 \times 174 + 262 \text{ lbs.} \\ &= 2600 \text{ lbs.}\end{aligned}$$

To achieve test weight, 3.0 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

SECTION 3.0
DATA REQUIRED BY R & D

The following pages are included in this section:

1. Dummy temperature control and position data
2. Dummy kinematic summary
3. Vehicle crush data
4. Dummy and vehicle accelerometer location and data summary
5. High speed camera information

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained portably until approximately 1 minute prior to the test.

The following table summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY

DRIVER DSP

REAR PASSENGER DSP

HEAD	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical and centered on bucket seat.
LOWER TORSO	Midsagittal plane is vertical and centered on bucket seat.
UPPER LEGS (thighs or femurs)	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.
KNEES	Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.
LOWER LEGS	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.
RIGHT FOOT	Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.
LEFT FOOT	Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.

Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.

Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.

Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.

Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.

Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

*NOTE: THE SIDE IMPACT DUMMY DOES NOT INCLUDE ARMS.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R & D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: BENCH
X BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
X ADJUSTABLE

TECHNICIANS:

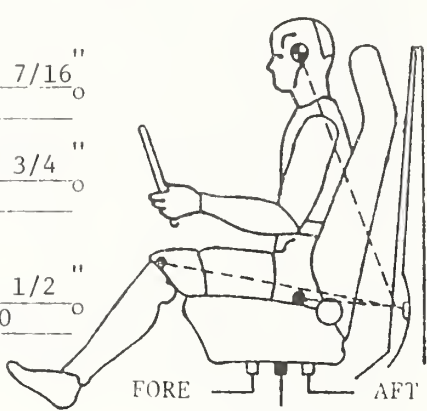
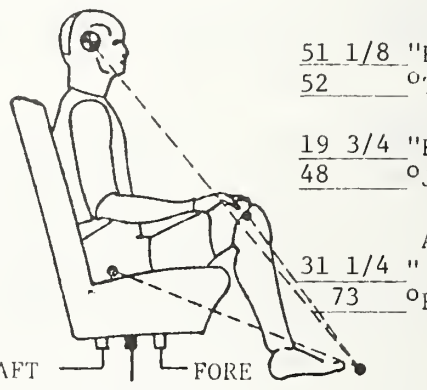
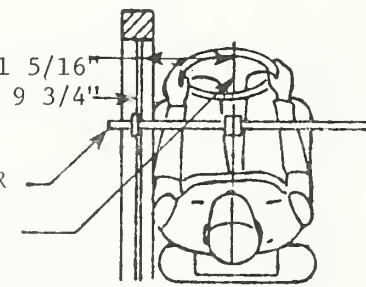
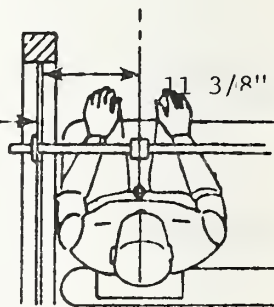
1. N. Echeverria

2. D. LeVally

3. B. Miller

POSITIONING DATE: 8/16/84

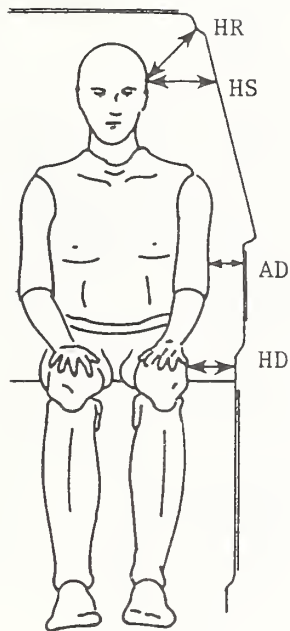
AMBIENT TEMP.: 70° F. TIME: 7:20

<p>DRIVER DUMMY # 06</p>  <p>HEAD <u>21 7/16"</u> TARGET*<u>41</u> KNEE <u>32 3/4"</u> JOINT <u>96</u> APPROX. "H" <u>19 1/2"</u> POINT <u>120</u></p> <p>FORE MIDPOINT AFT</p>	<p>REAR PASSENGER DUMMY # U02</p>  <p><u>51 1/8"</u> HEAD <u>52</u> °TARGET** <u>19 3/4"</u> KNEE <u>48</u> °JOINT APPROX. <u>31 1/4"</u> "H" <u>73</u> °POINT</p> <p>AFT MIDPOINT FORE</p>
<p>DOOR GLASS HEIGHT*** <u>11 5/16"</u> <u>9 3/4"</u></p> <p>LATERAL BAR ADJUSTABLE POINTER</p>  <p>DRIVER DUMMY # 06</p>	<p>DOOR GLASS HEIGHT <u>11 3/8"</u></p> <p>DNA</p>  <p>PASSENGER DUMMY # U02</p>

*All driver dummy dimensions referenced to top of striker bolt and all angles referenced to vertical.

**All passenger dummy dimensions referenced to front seat back latch bolt with front seat in mid-position and all angles referenced to vertical.

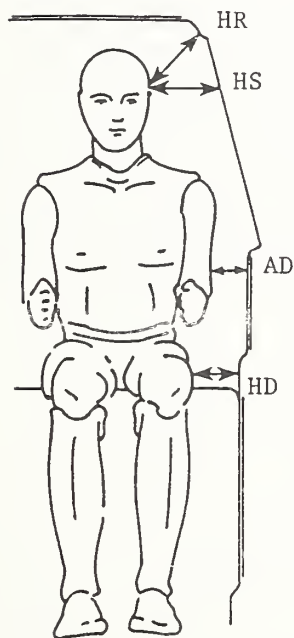
***Door glass height is equal on the right and left side of vehicle at dummy nose level.



DRIVER
J6

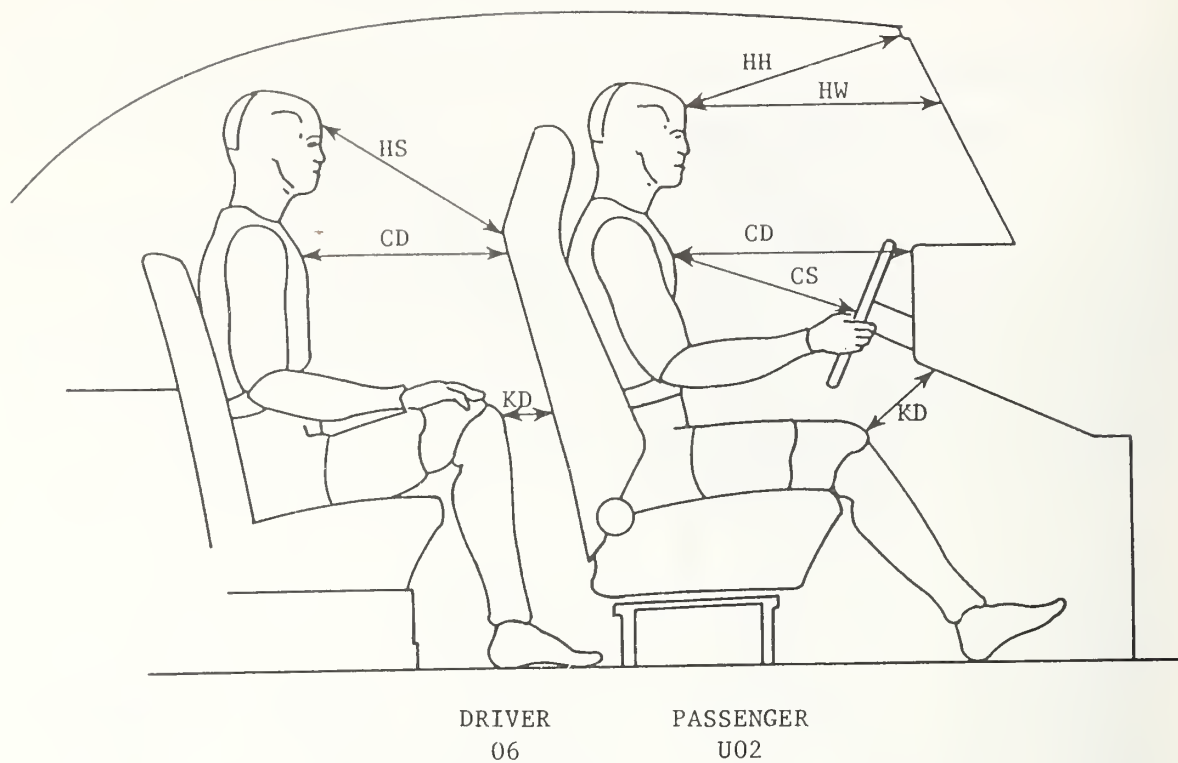
PASSENGER
U02

HR	6 5/8	7 3/8
HS	8 5/16	8 1/8
AD	3 1/2	2 1/4
HD	5 3/4	5 7/8



ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



HH	12 3/4	DNA
HW	20 5/16	DNA
HS	DNA	26 3/8
CD	18 3/4	19 1/4
CS	10 9/16	DNA
KDL	2 3/8	4 5/8
KDR	3	5 7/16

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the driver's inner door panel and the head went through the driver's window, which broke on impact, and grazed the fixed, rigid pole. The dummy then rebounded from the driver's door with its head striking the windshield, possibly causing the windshield to break. The dummy continued to move across the front occupant compartment and landed in the passenger seat. Final resting position showed the dummy's buttocks in the passenger seat and the torso facing the driver's side. The legs were extended across the occupant compartment with the left leg on the driver's seat and the right foot on the driver's side floor. The dummy's head was resting on the passenger's seat back and the inside window sill.

PASSENGER

The passenger dummy began in an upright position, centered behind the driver with the feet placed under the driver's seat. During impact, the dummy's torso hit the inner quarter panel and the B-Pillar and the left side of the head hit the side header and the side window. The dummy's motion continued as the head and left shoulder went through the side window and came outside the vehicle. The dummy came to rest with the torso resting against the left window sill, leaving the left shoulder and head sticking outside of the vehicle through the left rear window. The dummy's feet remained underneath the driver's seat.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH

ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	-24	-18	-12	-6	0	6	12	18	24	30	36	42	48	54	60
PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)																
Axle Height	10.5	19.6	20.0	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.5	X	X	X
H-Point	20.3	18.0	18.0	18.0	17.9	17.8	17.8	17.8	17.8	17.8	17.8	18.0	18.0	X	X	X
Mid Door	23.3	17.8	17.8	17.8	17.8	17.6	17.5	17.5	17.5	17.5	17.6	17.8	17.8	18.0	X	X
Window Sill	34.0	19.5	19.5	19.3	19.3	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.3	19.4	X	X
Window Top	52.0	X	X	X	26.8	26.5	26.3	26.3	26.0	26.0	26.0	26.3	26.5	26.8	X	X

POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)

Axle Height	10.5	24.0	25.3	26.9	28.6	30.5	32.5	34.0	33.0	28.8	24.5	24.0	22.0	X	X	X
H-Point	20.3	22.0	23.0	25.3	27.8	30.5	32.9	34.5	33.8	29.0	24.8	22.8	21.3	X	X	X
Mid Door	23.3	21.8	22.6	25.0	27.6	30.3	33.0	34.8	34.0	29.5	25.0	22.8	21.4	20.4	X	X
Window Sill	34.0	22.8	23.4	25.3	27.5	29.9	32.4	35.0	35.3	31.5	27.5	23.8	21.8	21.5	X	X
Window Top	52.0	X	X	X	31.0	31.5	33.8	36.5	37.1	34.8	31.1	29.8	29.3	29.3	X	X

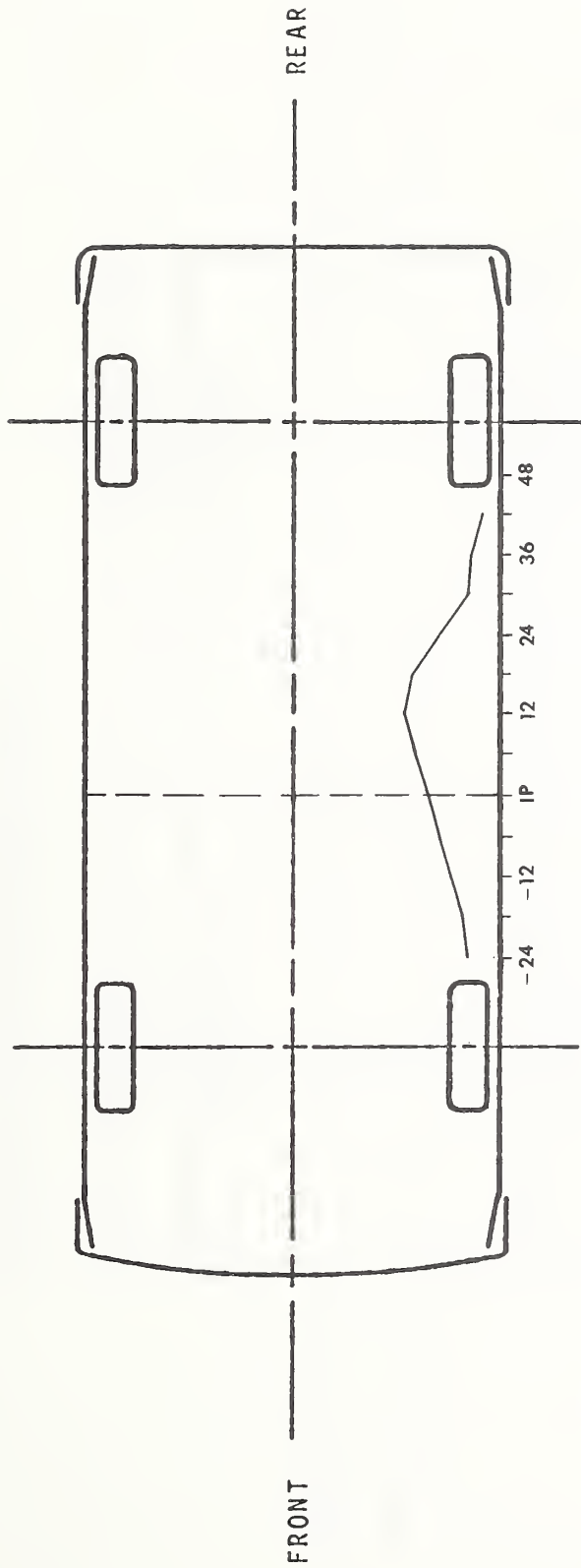
STATIC CRUSH (IN)

Axle Height	10.5	4.4	5.3	7.1	8.8	10.7	12.7	14.2	13.2	9.0	4.7	4.2	2.5	X	X	X
H-Point	20.3	4.0	5.0	7.3	9.9	12.7	15.1	16.7	16.0	11.2	7.0	4.8	3.3	X	X	X
Mid Door	23.3	4.0	4.8	7.2	9.8	12.7	15.5	17.3	16.5	12.0	7.4	5.0	3.6	2.4	X	X
Window Sill	34.0	3.3	3.9	6.0	8.2	10.9	13.4	16.0	16.3	12.5	8.5	4.8	2.5	2.1	X	X
Window Top	52.0	X	X	X	4.2	5.0	7.5	10.2	11.1	8.8	5.1	3.5	2.8	2.5	X	X

* Projected impact point is 9 inches forward of driver's side wheelbase midpoint. Column readings are front to rear from left to right.

** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE

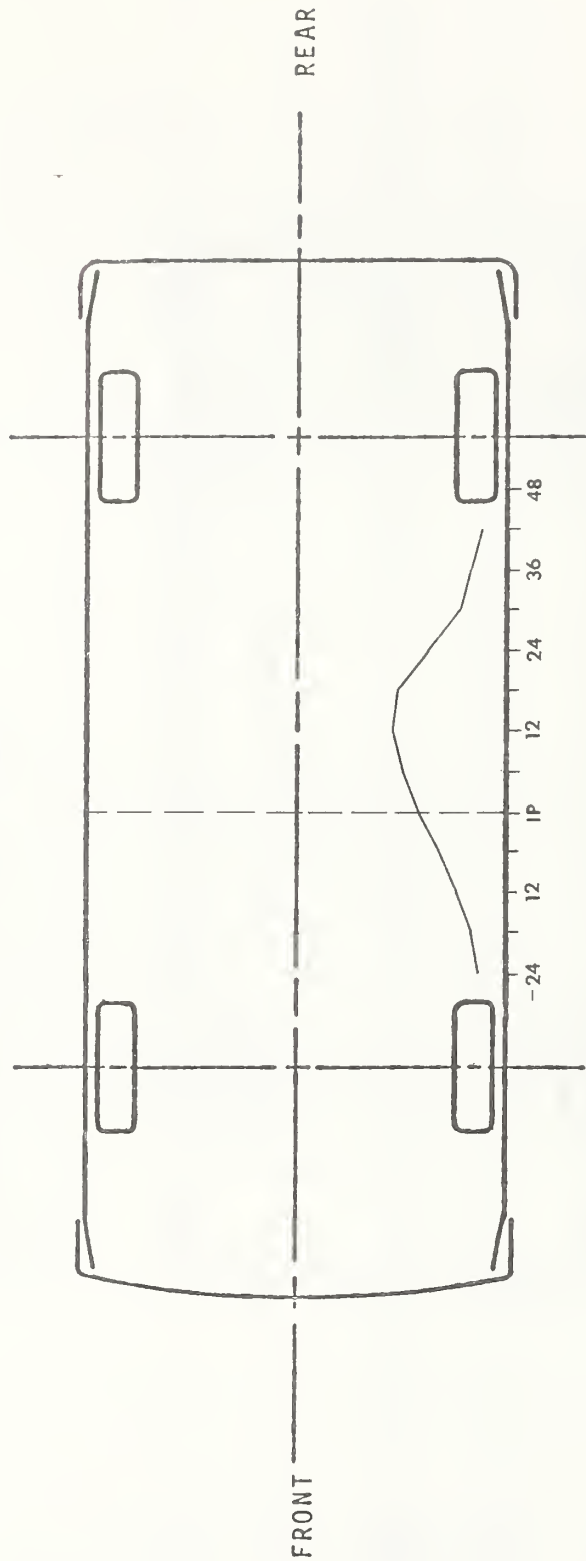


PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 153.8"

Maximum Crush = 14.3"
Length of Crush = 66.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

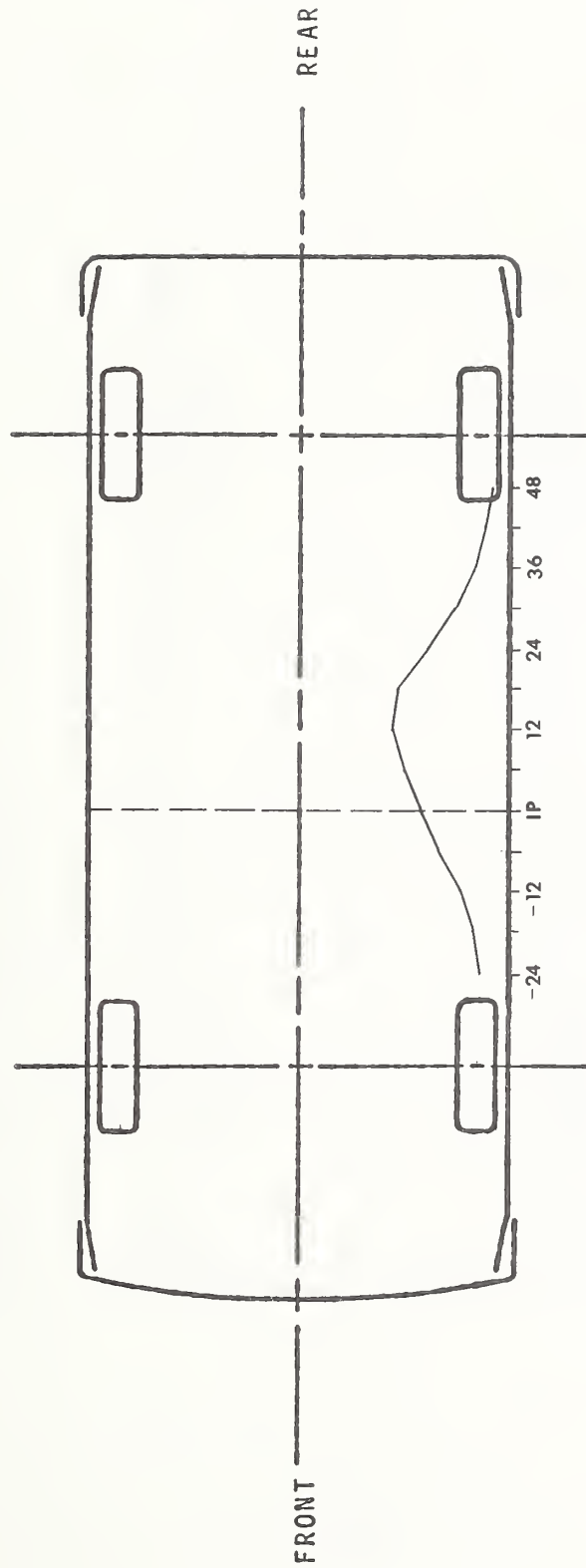


PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 153.8"

Maximum Crush = 16.8"
Length of Crush = 66.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

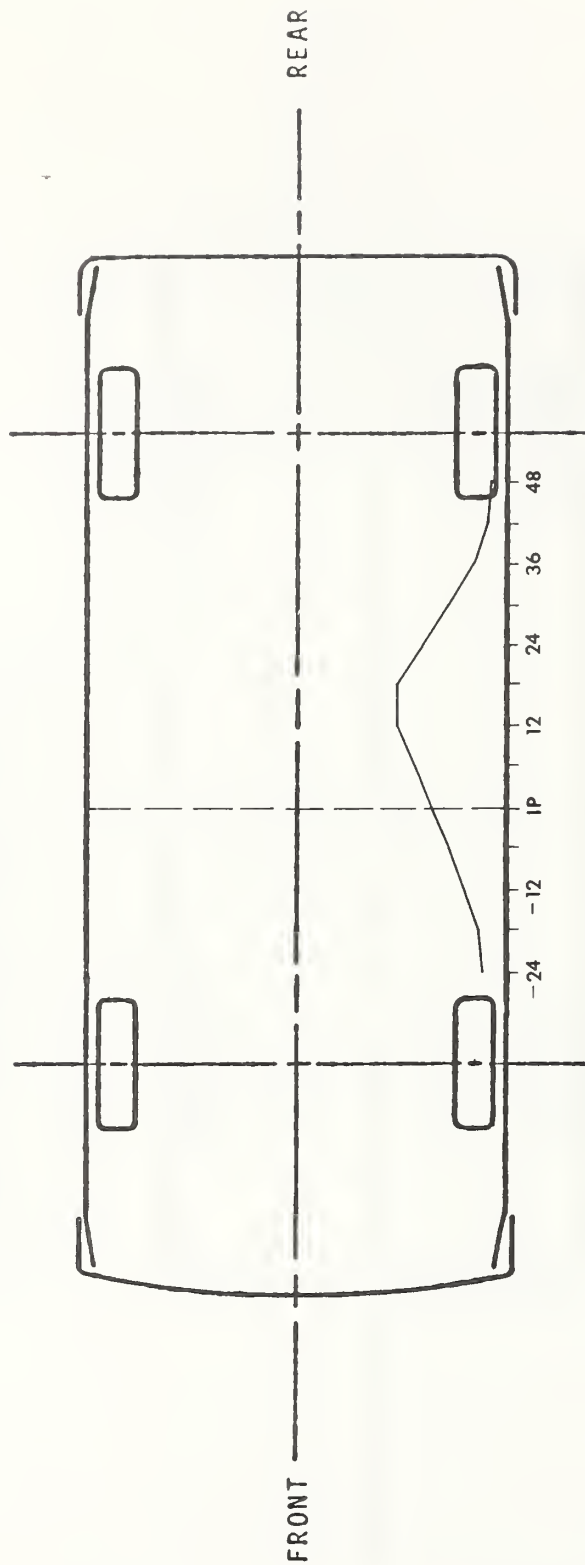


PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 153.8"

Maximum Crush = 17.3"
Length of Crush = 72.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE

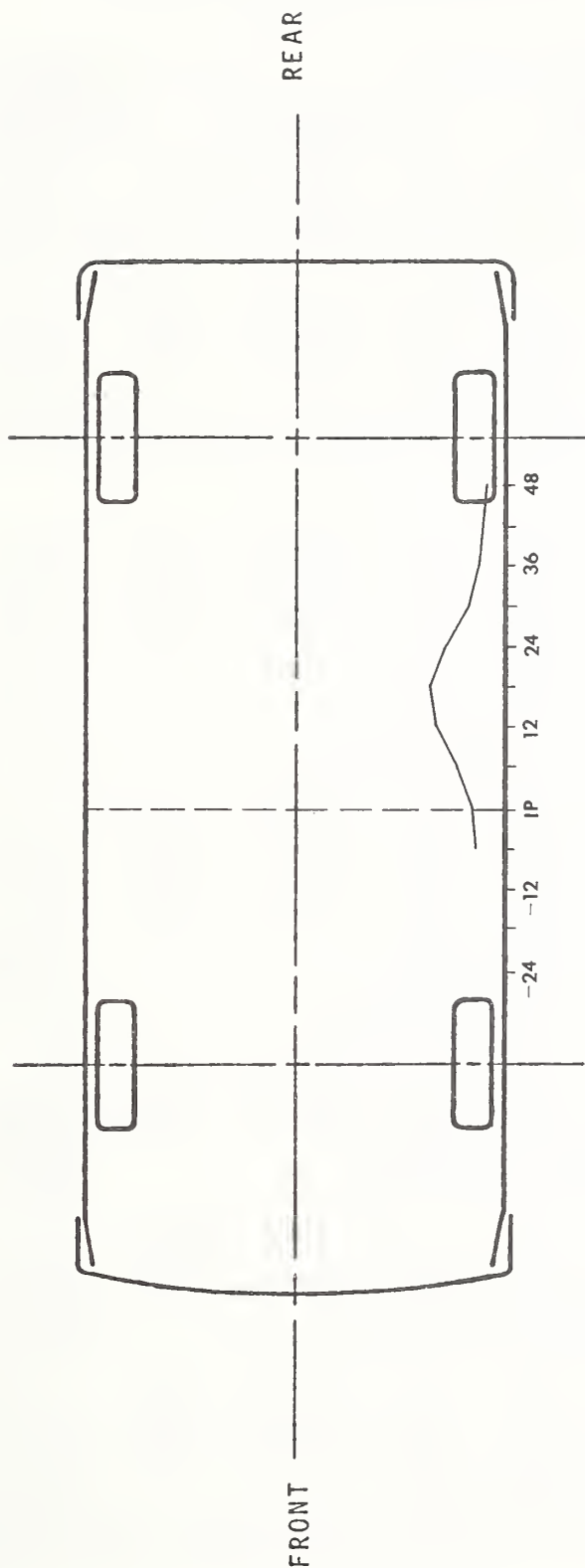


PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 153.8"

Maximum Crush = 16.3"
Length of Crush = 72.0"

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
IP EQUALS PROJECTED IMPACT POINT

Width of Car = 63.5"
Length of Car = 153.8"

Maximum Crush = 11.1"
Length of Crush = 54.0"

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX - (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION								
LONGITUDINAL	22.34	157.25	18.57	109.63	22.31	93.50	55.07	108.50
LATERAL	25.52	43.00	17.70	122.00	55.22	65.63	47.53	107.13
VERTICAL	3.52	23.63	31.96	62.50	41.37	91.63	39.26	109.25
RESULTANT		34.42 @ 63.75				76.89 @ 107.13		
HIC	152.30	from 39.62 to 169.50			512.60	from 60.88 to 136.75		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	18.32	66.25	14.55	57.50	12.00	136.25	41.07	98.12
LATERAL (P)***	63.05	40.63	18.67	55.63	34.36	75.00	4.99	93.13
LATERAL (R)***	64.35	40.63	17.44	55.63	35.76	81.25	4.16	93.13
VERTICAL	10.69	65.63	1.94	38.75	11.54	67.50	15.42	98.75
RESULTANT (P)		63.06 @ 40.63				47.86 @ 98.75		
RESULTANT (R)		64.36 @ 40.63				48.07 @ 98.75		
DELTA V (MPH)****		23.1 @ 53.12 (P)				18.5 @ 108.13 (P)		
		23.7 @ 63.75 (R)				19.9 @ 108.75 (R)		
LOWER SPINE								
LONGITUDINAL	12.27	39.38	12.71	27.50	2.17	44.38	22.16	65.63
LATERAL (P)	72.90	35.63	11.93	55.63	35.45	73.13	11.21	108.13
LATERAL (R)	73.34	35.63	10.54	55.63	38.03	83.12	9.29	98.75
VERTICAL	7.63	31.88	---	---	14.55	68.13	9.41	99.37
RESULTANT (P)		73.24 @ 35.63				41.38 @ 81.88		
RESULTANT (R)		73.67 @ 35.63				44.20 @ 82.50		
DELTA V (MPH)		26.2 @ 52.50 (P)				24.6 @ 96.25 (P)		
		25.9 @ 53.12 (R)				25.8 @ 95.62 (R)		
LEFT UPPER RIB								
LATERAL (P)	50.55	23.13	4.46	68.13	42.83	81.25	6.18	63.12
LATERAL (R)	51.04	23.13	3.25	68.75	40.75	81.25	6.92	63.12
DELTA V (MPH)		22.5 @ 76.25 (P)				23.6 @ 110.62 (P)		
		22.7 @ 65.63 (R)				23.9 @ 110.62 (R)		
LEFT LOWER RIB								
LATERAL (P)	55.80	21.25	21.96	60.62	40.50	83.12	8.96	111.25
LATERAL (R)	58.07	21.25	20.23	60.62	41.96	82.50	7.08	110.62
DELTA V (MPH)		21.5 @ 72.50 (P)				24.8 @ 108.12 (P)		
		22.2 @ 71.25 (R)				24.9 @ 108.12 (R)		
PELVIS ACCELERATION								
LONGITUDINAL	4.48	48.13	21.85	52.88	2.92	30.75	32.09	67.13 °
LATERAL	55.37	32.75	8.71	53.50	44.64	75.00 °	20.35	59.88
VERTICAL	8.60	58.00	5.68	24.38	12.39	80.88	2.73	105.13
RESULTANT		55.38 @ 32.75				56.67 @ 76.25 °		
DELTA V (MPH)		21.9 @ 51.13				29.8 @ 135.50 °		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)
RIB DEFLECTION †	1.86	56.00	---	--- ε	0.78	95.88	---	--- ε

* LONGITUDINAL:	FORWARD	**LONGITUDINAL:	REARWARD
LATERAL:	RIGHTWARD	LATERAL:	LEFTWARD
VERTICAL:	UPWARD	VERTICAL:	DOWNWARD

*** (P) = Primary Sensor, (R) = Redundant Sensor

**** For dummy channels, Delta V is the velocity change at the approximate time of separation from the contact area.

† Compression: Positive

ε There were no negative values in the time interval of interest.

° The CTM has judged that intermittent rattling has occurred in these channels and, therefore, the peak values reported are questionable as are applicable resultants and Delta V's.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

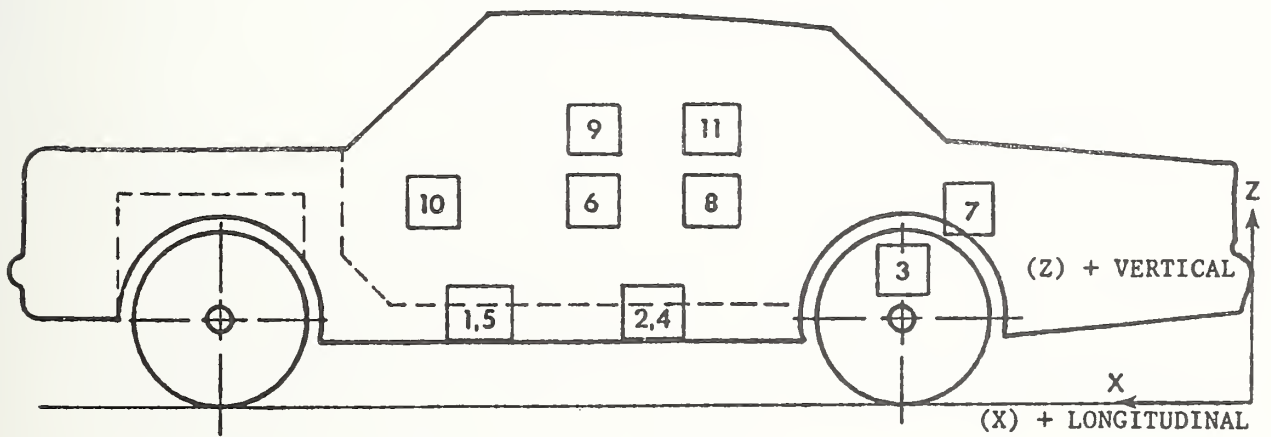
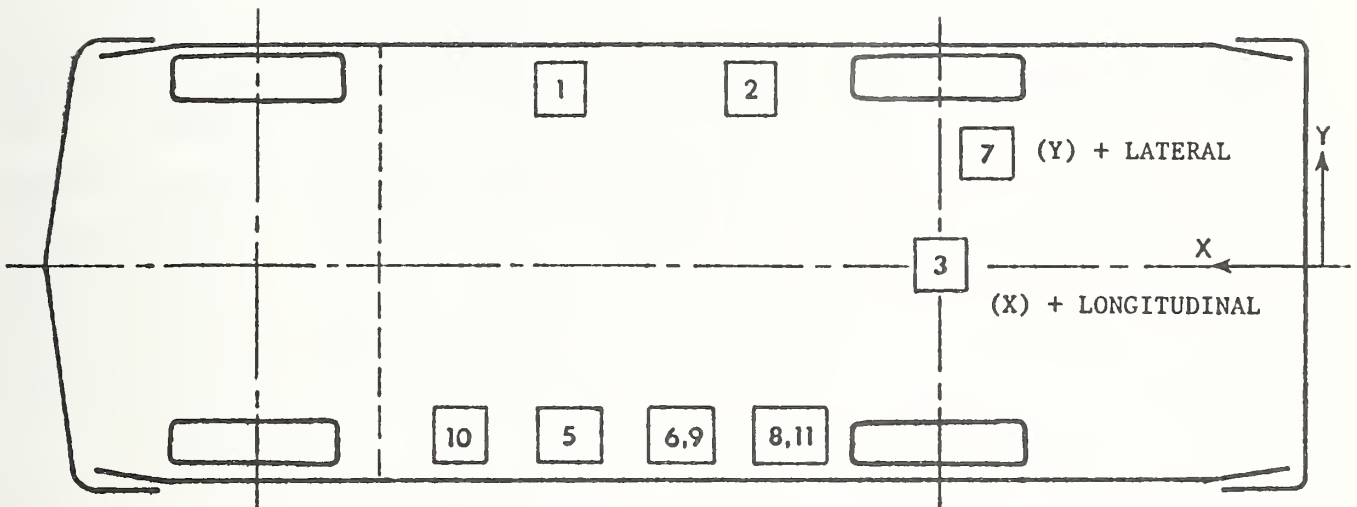
NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT	83.4	23.4	11.3				
	(LONGITUDINAL)	$\Delta V = -9.6 \text{ mph @ } 145.00 \text{ msec}$			2.06	53.75	9.87	60.00
	(LATERAL)	$\Delta V = 11.7 \text{ mph @ } 145.00 \text{ msec}$			16.06	54.88	1.89	80.88
	(VERTICAL)				6.47	48.88	3.35	108.13
	(RESULTANT)					16.26 @	38.88	
2	RIGHT SILL AT REAR SEAT	61.4	23.7	9.4				
	(LONGITUDINAL)	$\Delta V = -9.0 \text{ mph @ } 145.00 \text{ msec}$			1.03	134.13	8.17	65.00
	(LATERAL)	$\Delta V = 15.4 \text{ mph @ } 145.00 \text{ msec}$			20.14	38.88	2.63	95.13
	(VERTICAL)				5.08	63.50	4.16	108.00
	(RESULTANT)					20.64 @	39.00	
3	REAR DECK OVER AXLE	32.0	0.0	6.1				
	(LONGITUDINAL)	$\Delta V = -12.2 \text{ mph @ } 145.00 \text{ msec}$			2.27	121.38	13.93	82.13
	(LATERAL)	$\Delta V = 24.7 \text{ mph @ } 145.00 \text{ msec}$			18.60	67.75	2.10	134.38
	(VERTICAL)				4.26	20.13	4.73	101.75
	(RESULTANT)					21.65 @	67.75	
4	LEFT SILL AT REAR SEAT	61.0	-23.6	8.6				
	(LATERAL)	$\Delta V = 16.9 \text{ mph @ } 59.38 \text{ msec}$			38.64	46.88	11.25	65.75
5	LEFT SILL AT FRONT SEAT	83.4	-23.3	10.7				
	(LATERAL)	$\Delta V = \text{---} \text{ --- } \tau$			34.40	24.88	22.49	32.25
6	LEFT FRONT DOOR CENTERLINE	80.3	-26.0	22.9				
	(LATERAL)	$\Delta V = \text{---} \text{ --- } \tau$			149.03	13.63	52.37	34.63
7	RIGHT REAR COMPARTMENT	31.0	-15.4	13.8				
	(LONGITUDINAL)				2.06	125.00	11.35	68.75
8	MIDREAR OF LEFT FRONT DOOR	60.1	-26.2	22.9				
	(LATERAL)	$\Delta V = 22.7 \text{ mph @ } 54.75 \text{ msec}$			82.92	50.13	46.62	14.00
9	UPPER LEFT FRONT DOOR CENTERLINE	81.2	-26.0	31.9				
	(LATERAL)	$\Delta V = \text{---} \text{ --- } \tau$			143.00	15.63	108.45	25.50
10	MIDFRONT OF LEFT FRONT DOOR	99.1	-25.9	22.0				
	(LATERAL)	$\Delta V = \text{---} \text{ --- } \tau$			30.91	8.38	45.97	12.38
11	UPPER REAR OF LEFT REAR DOOR	70.2	26.1	31.9				
	(LATERAL)	$\Delta V = \text{---} \text{ --- } \tau$			83.43	30.75	155.73	25.75

* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right),
Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

τ This Delta V appears unrealistic

VEHICLE ACCELEROMETER LOCATIONS



FIXED POLE LOAD CELL LOCATIONS AND DATA SUMMARY

CELL NO. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
				MAX (lb)	TIME (msec)	MAX (lb)	TIME (msec)
1	17.75	-3.25	72.5	8002.45	76.13	10643.96	42.75
2	17.75	3.25	72.5	5790.47	29.13	15038.08	68.50
3	17.75	-3.25	4.0	---	--- ^x	20076.66	38.25
4	17.75	3.25	4.0	2266.91	133.50	26261.08	67.50
TOTAL FORCE				---	--- ^x	46401.70	50.13

*Reference Facing Pole Front
X - Pole Base (+ forward)
Y - Pole Centerline (+ right)
Z - Ground Level (+ up)

All location measurements are in inches.

Compression - Negative

^xThere were no positive values in the time interval of interest.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonic 1B	25	497	Impact point
2	Overhead	Photosonic 1B	13	500	Vehicle dynamics
3	Left Side	Photosonic 1B	13	450	Vehicle dynamics
4	Behind Pole	Photosonic 1B	25	520	Impact point
5	Onboard - Front	Photosonic 1B	8	800	Driver kinematics
6	Onboard - Driver Side	Photosonic 1B	8	792	Driver kinematics
7	Onboard - Back	Photosonic 1B	8	792	Passenger kinematics

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.
 (24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH
 AND CRASH EVENT SPLICED AT START AND END OF FILM.

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	-3' 1/2"	2"	17'3"
2	13'11"	10'3"	13'3"
3	-3'5"	-24'4"	52'1/2"
4	12'9"	5'3/4"	32'1/2"

Origin of Coordinate System is Point of Impact

+X = Forward of Impact Side of Pole with Respect to Striking Vehicle's Velocity Vector

+Y = Rightward from Centerline of Pole

+Z = Upward with Respect to Striking Vehicle's Velocity Vector

APPENDIX A
PHOTOGRAPHS



Figure A-1. PRE-TEST OVERALL - VIEW 1



Figure A-2. PRE-TEST OVERALL - VIEW 2
A-2



Figure A-3. PRE-TEST OVERALL - VIEW 3

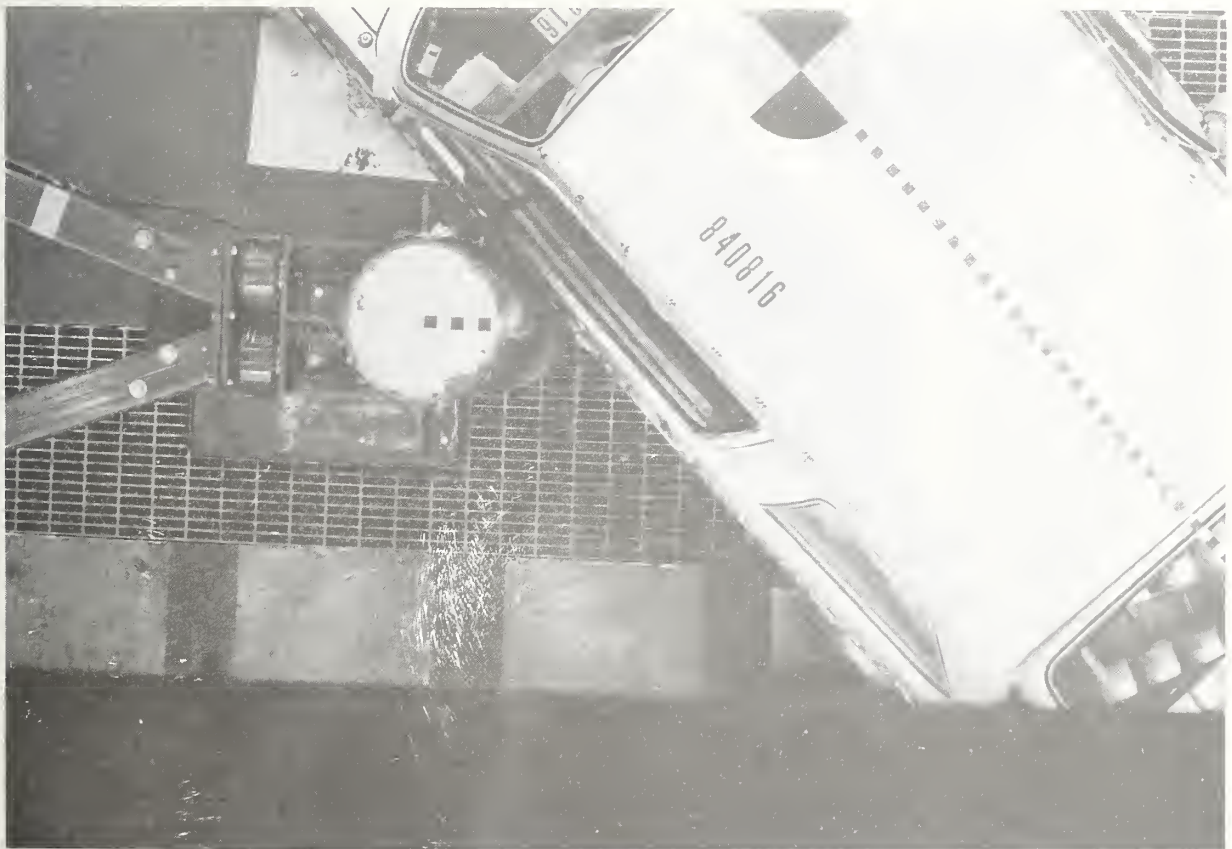


Figure A-4. PRE-TEST OVERALL - VIEW 4
A-3



Figure A-5. PRE-TEST CLOSEUP

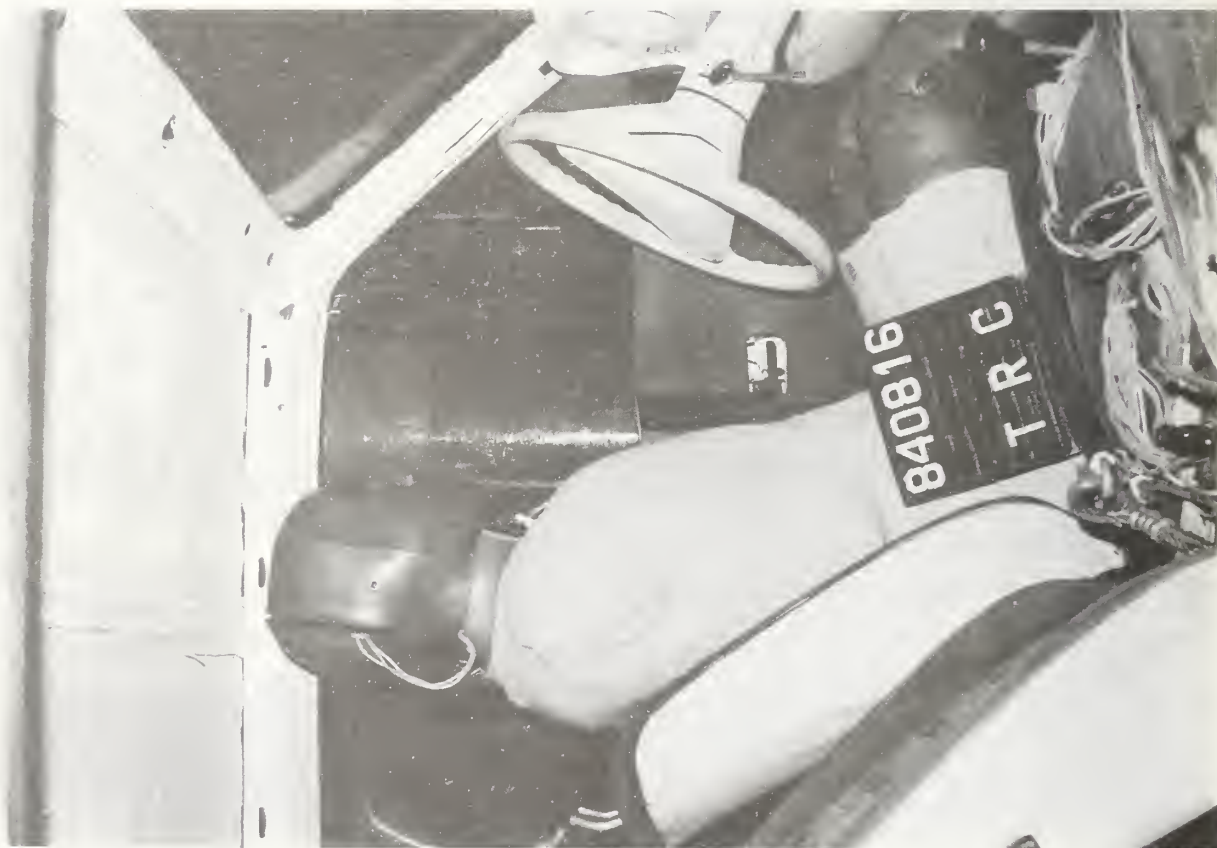


Figure A-6. PRE-TEST DRIVER DUMMY - VIEW 1
A-4



Figure A-7. PRE-TEST DRIVER DUMMY - VIEW 2



Figure A-8. PRE-TEST PASSENGER DUMMY - VIEW 1
A-5

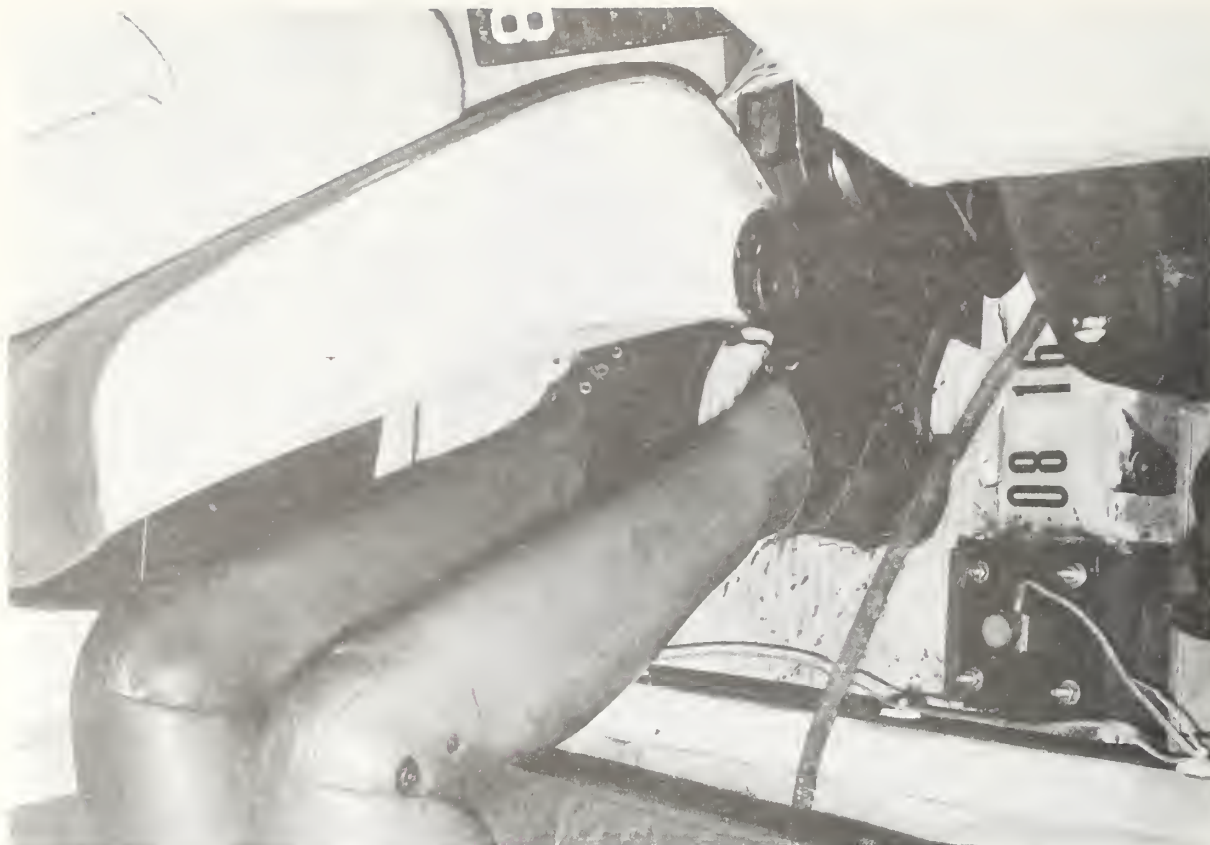


Figure A-9. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-10. PRE-TEST DUMMIES OVERALL
A-6



Figure A-11. POST-TEST OVERALL - VIEW 1



Figure A-12. POST-TEST OVERALL - VIEW 2
A-7



Figure A-13. POST-TEST OVERALL - VIEW 3



Figure A-14. POST-TEST OVERALL - VIEW 4
A-8

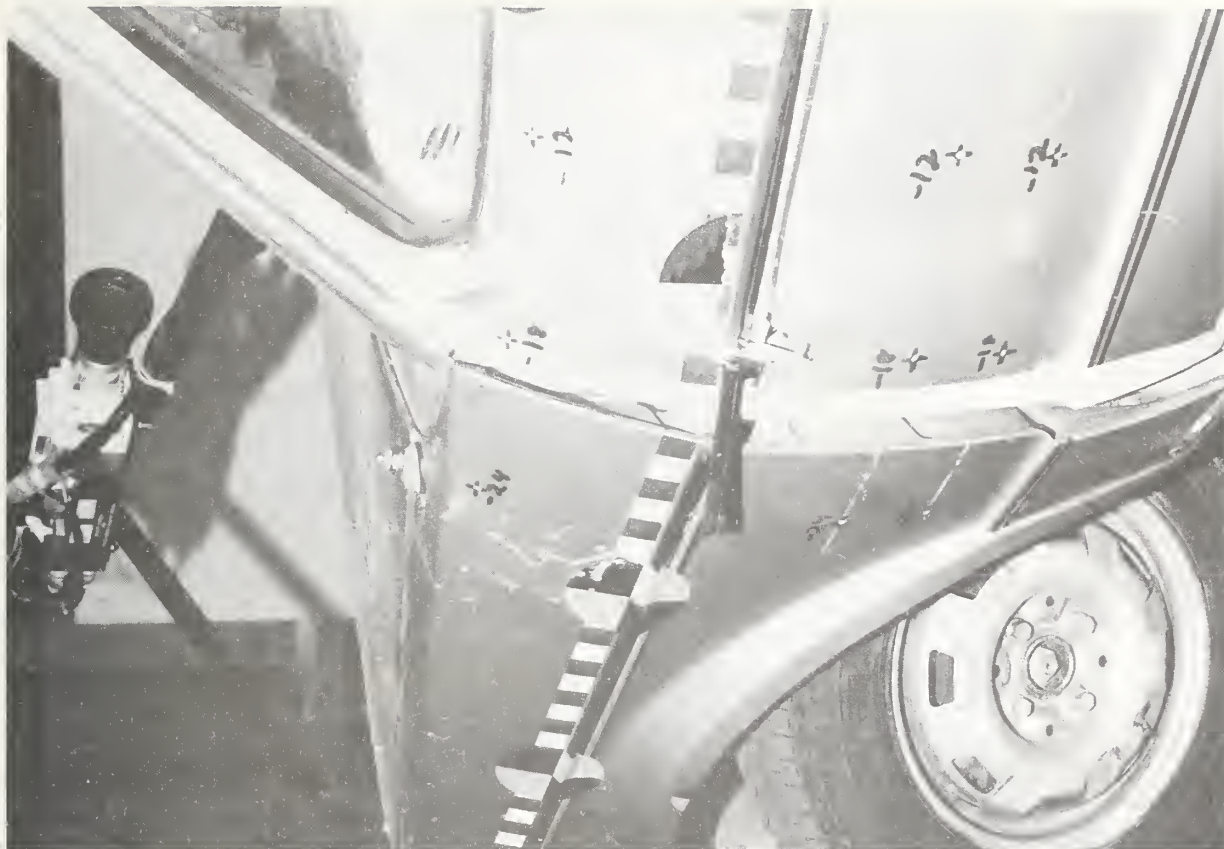




Figure A-17. POST-TEST DRIVER DUMMY - VIEW 1



Figure A-18. POST-TEST DRIVER DUMMY - VIEW 2
A-10



Figure A-19. POST-TEST DRIVER DUMMY - VIEW 3



Figure A-20. POST-TEST PASSENGER DUMMY - VIEW 1



Figure A-21. POST-TEST PASSENGER DUMMY - VIEW 2



Figure A-22. POST-TEST DUMMIES OVERALL
A-12

APPENDIX B

DATA PLOT PRESENTATION

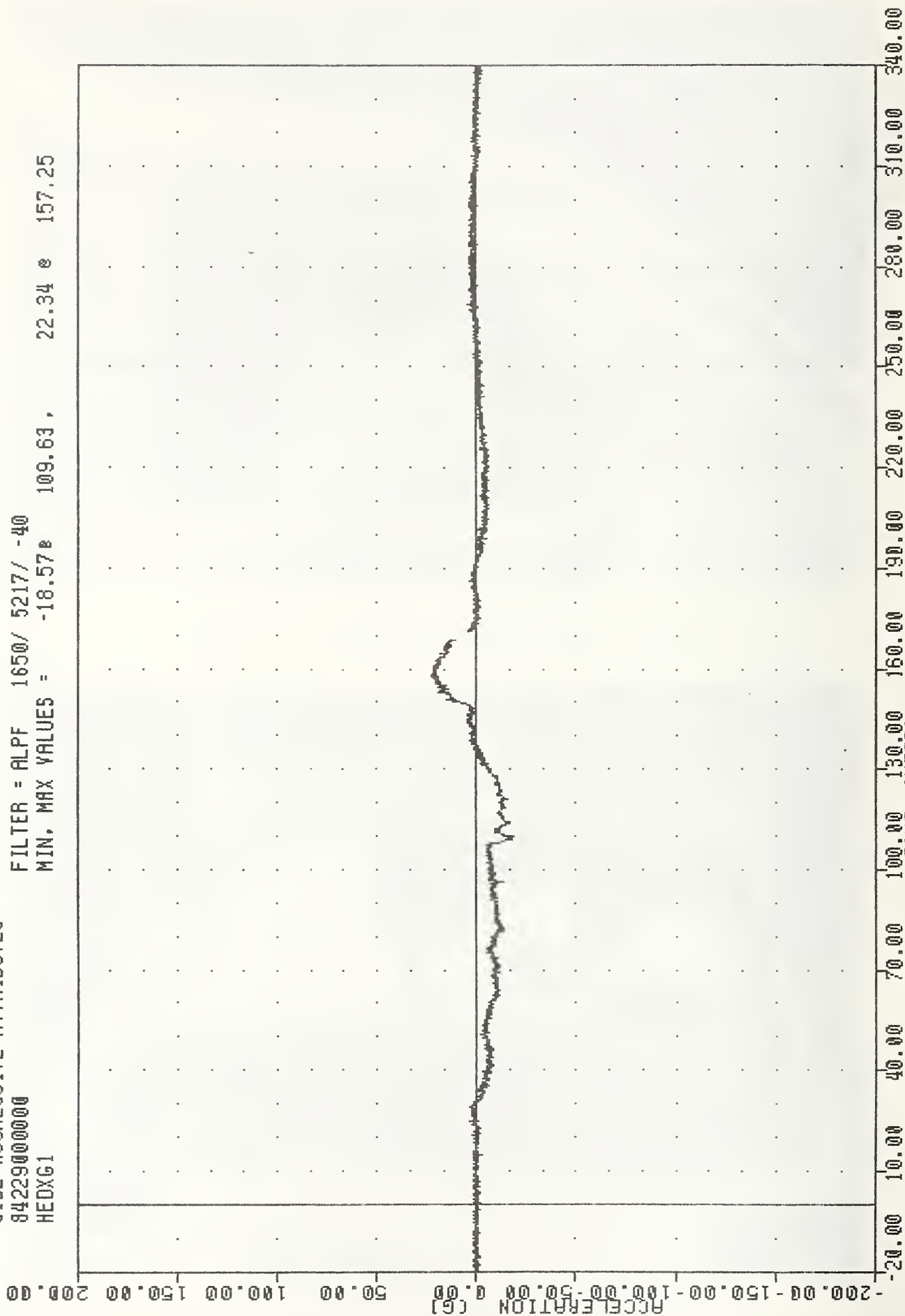
Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. The data was filtered according to SAE J211, except dummy thorax data which was filtered using the HSRI filter.

TRC , 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
HEDXG1

PLUI DATE 24-HUG-84 08:23:36

FILTER = ALPF 1650/ 5217/ -40

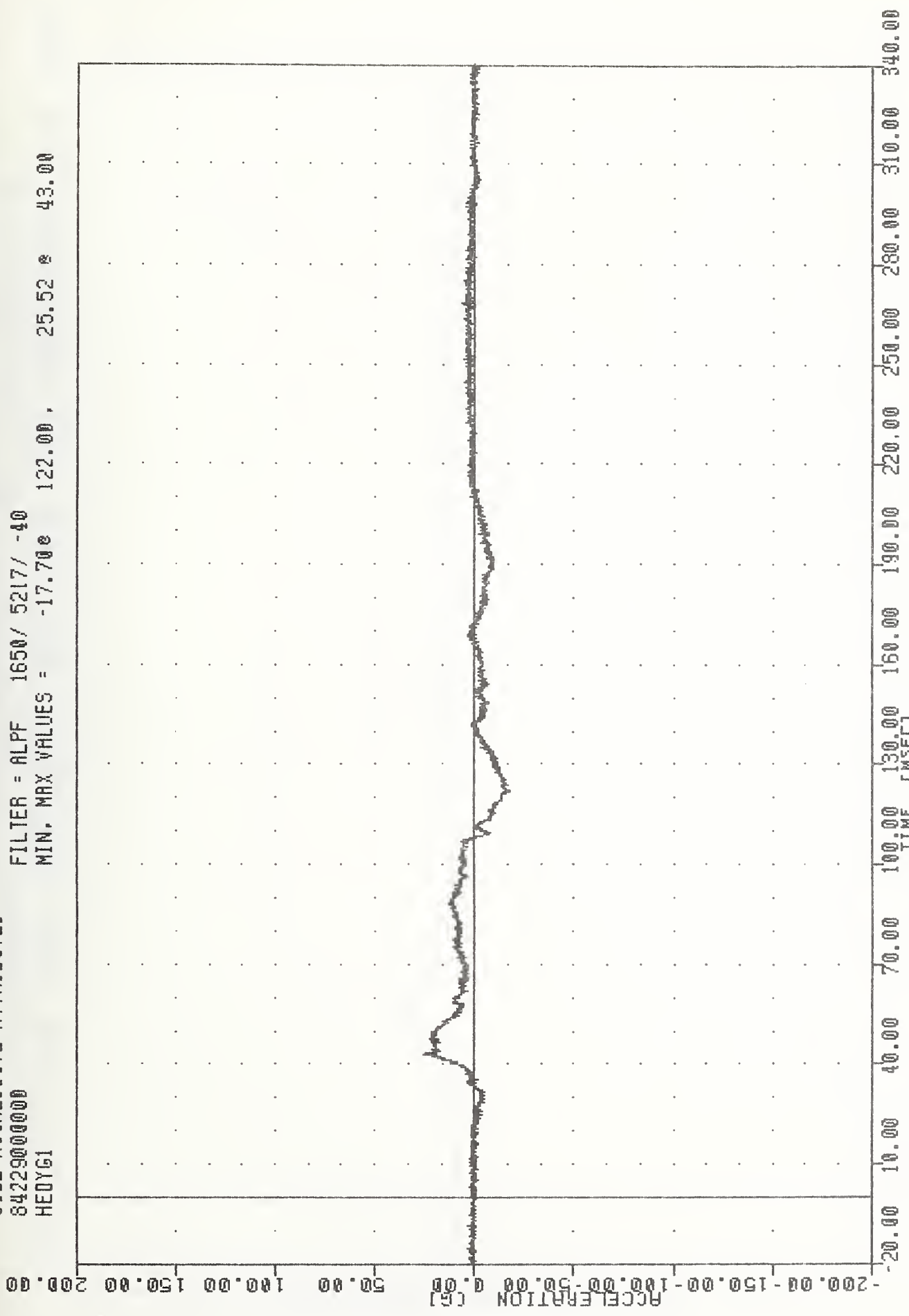
MIN. MAX VALUES = -18.57 109.63, 22.34 157.25



THU , 840815
SIDE AGGRESSIVE ATTRIBUTES
84229000000
HEDY61

PLU1 DATE 24-HUG-84 08:23:36

FILTER = ALPF 1650 / 5217 / -40
MIN. MAX VALUES = -17.700 122.00 , 25.52 43.00



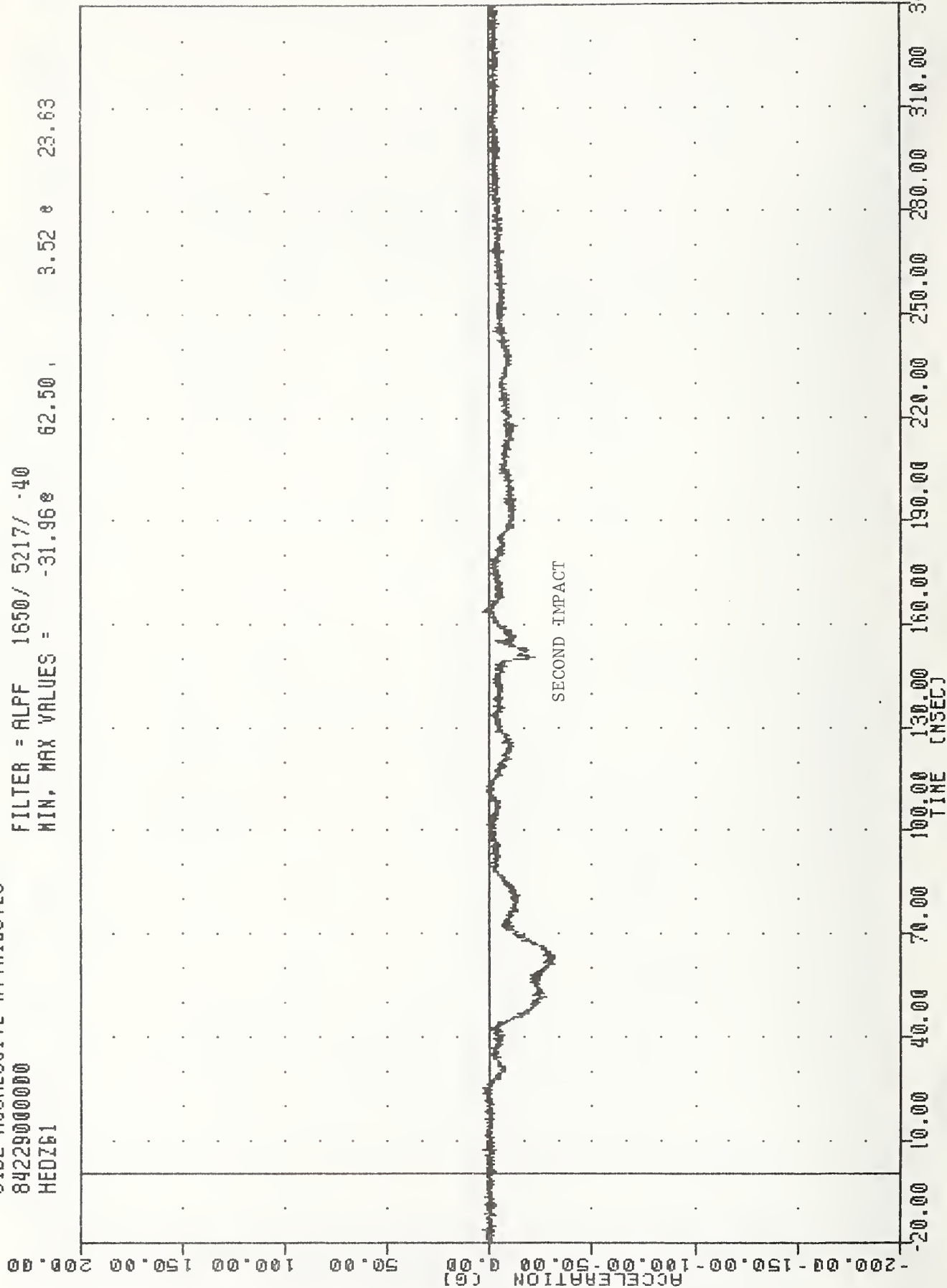
45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER HEAD ACCELERATION Y AXIS

THU , 840816
SIDE AGGRESSIVE ATTRIBUTES
842290000000
HEDZ61

PLU1 DATE 24-HUG-84 08:23:36

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -31.96 62.50 , 3.52 23.63



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER HEAD ACCELERATION Z AXIS

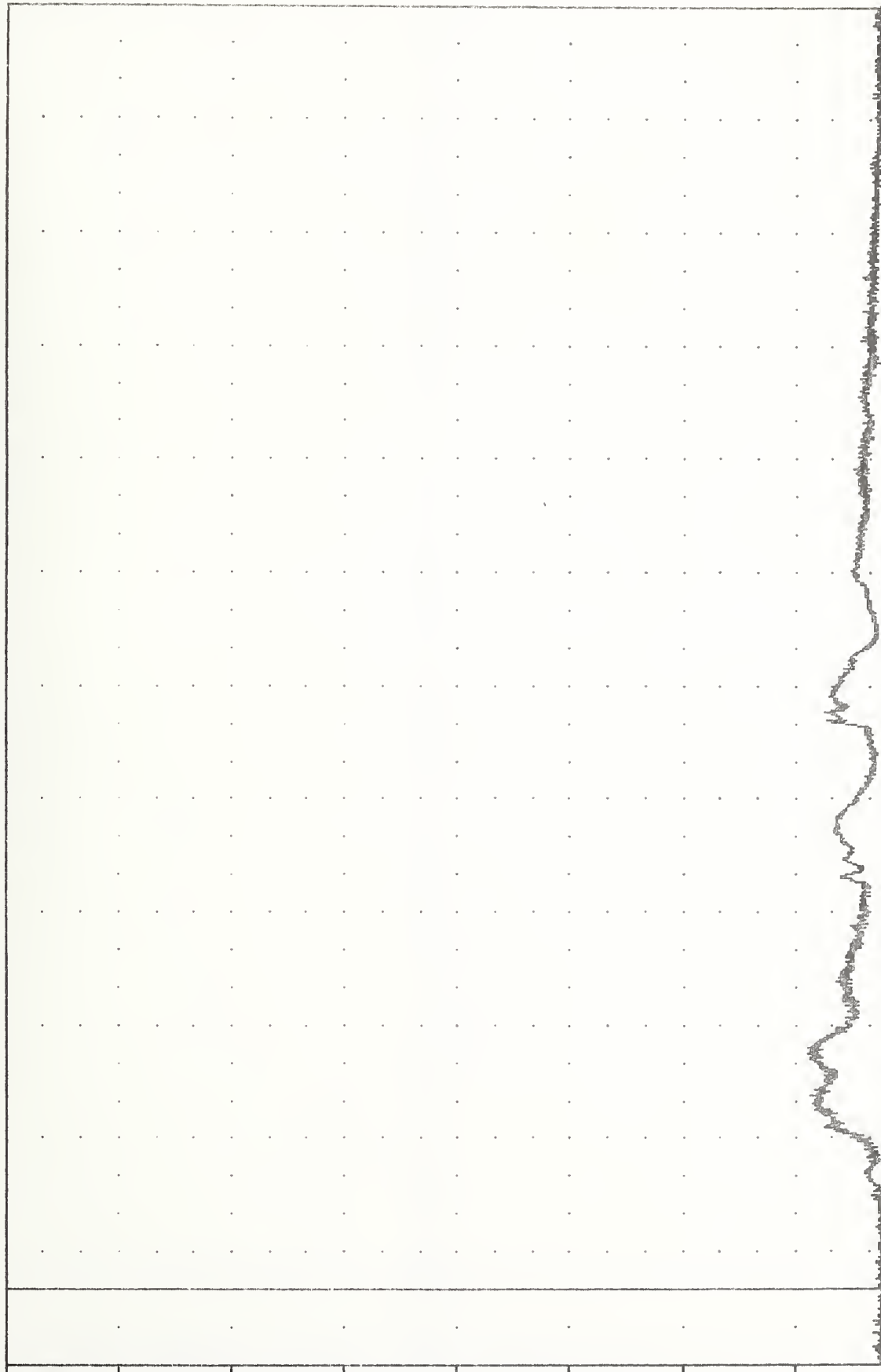
TNL 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 HEADG1

FLUOR DRIC 24 AUG 04 00:23:00

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.100 14.00 , 34.42 0 63.75

ACCELERATION (G)



-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE

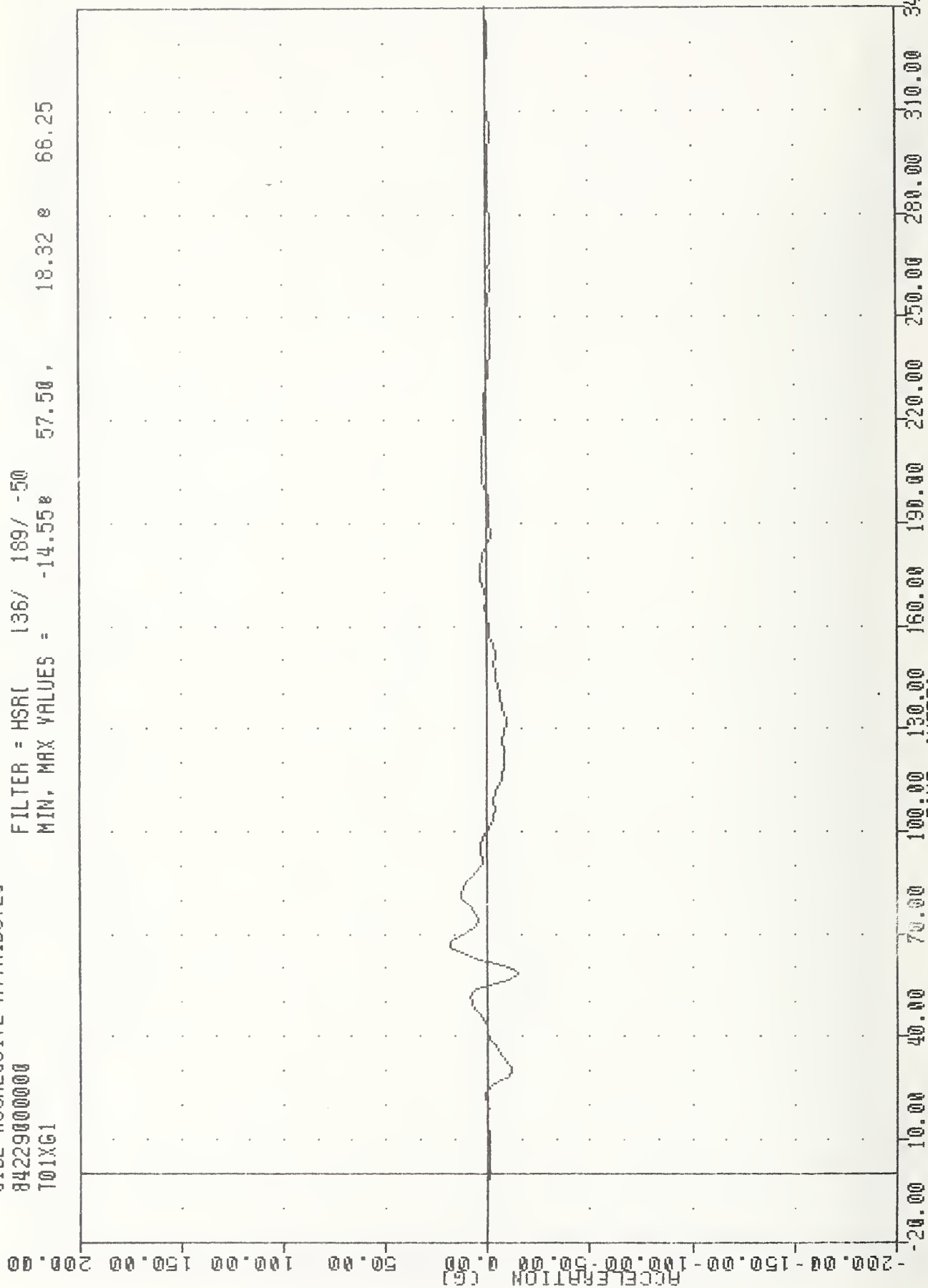
DRIVER HEAD RESULTANT

IML , 84081b
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 T01XG1

PLU1 DATE 24-HUG-84 08:24:26

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -14.55g 57.50, 18.32 g 66.25

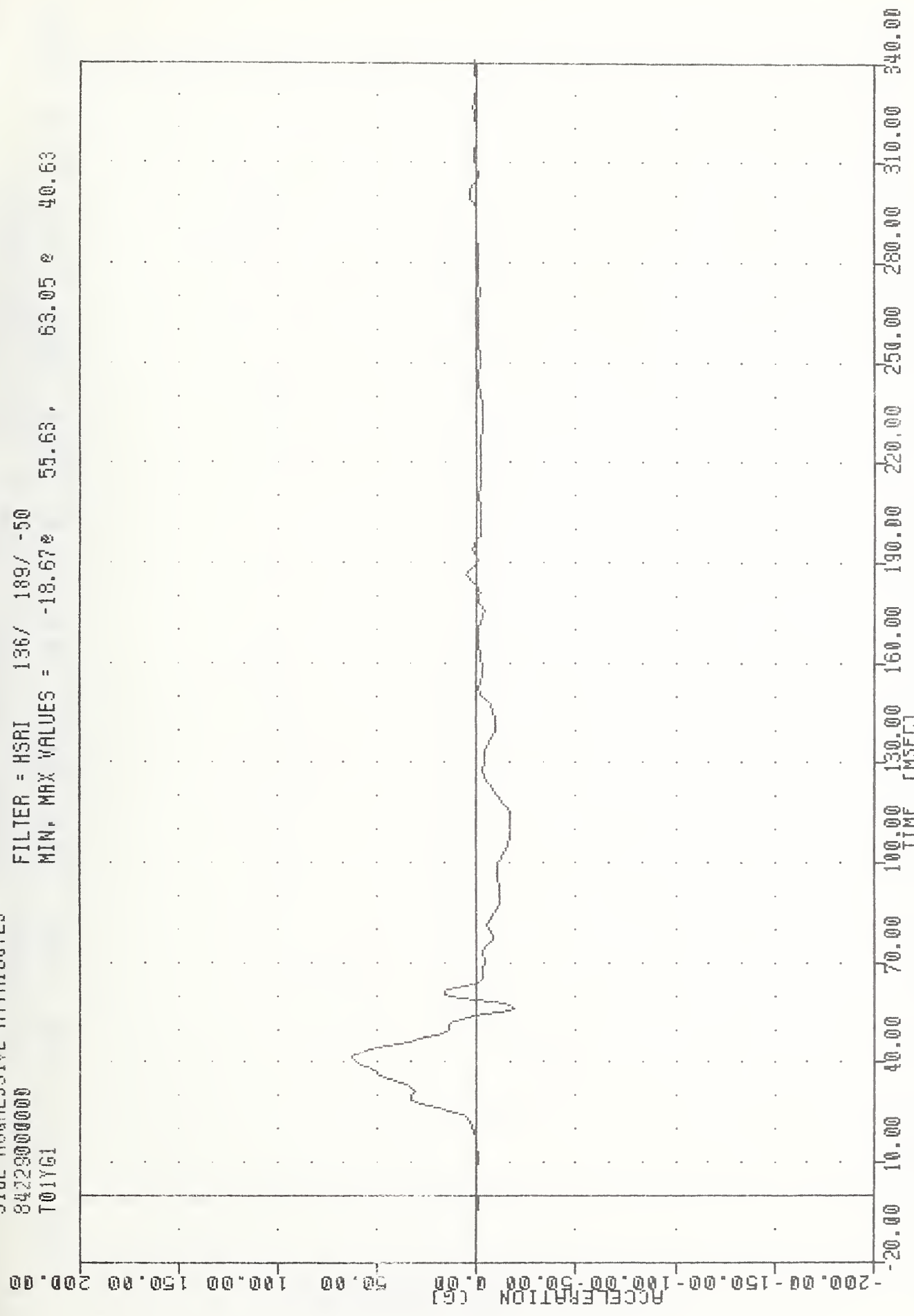


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER UPPER SPINE ACCELERATION X AXIS

INC 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T01Y61

PLU1 DRIC 24-0UG-04 00:24:20

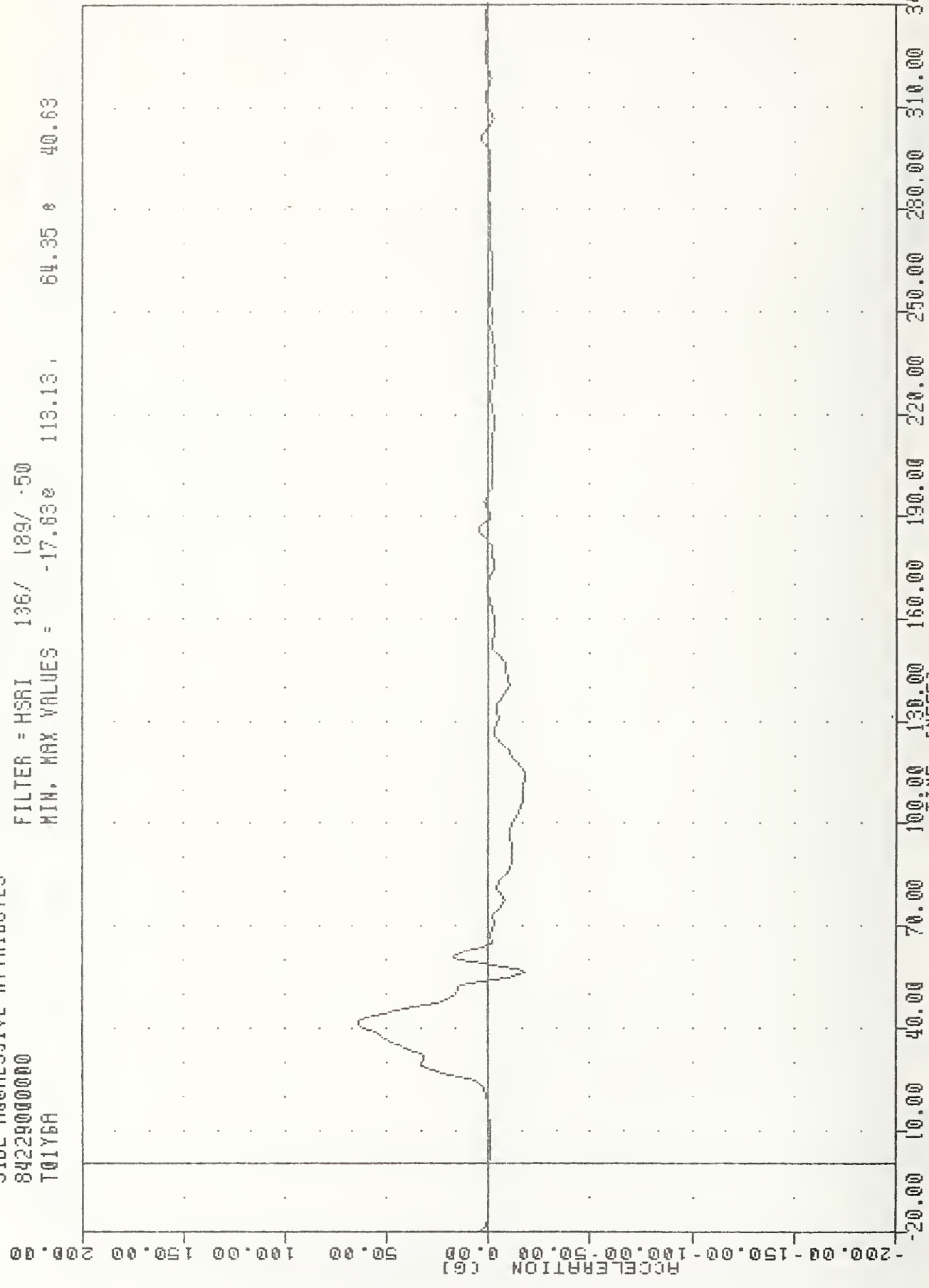
FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -18.67e 55.63, 63.05 e 40.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE ACCELERATION Y AXIS

TOL 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T01Y6A

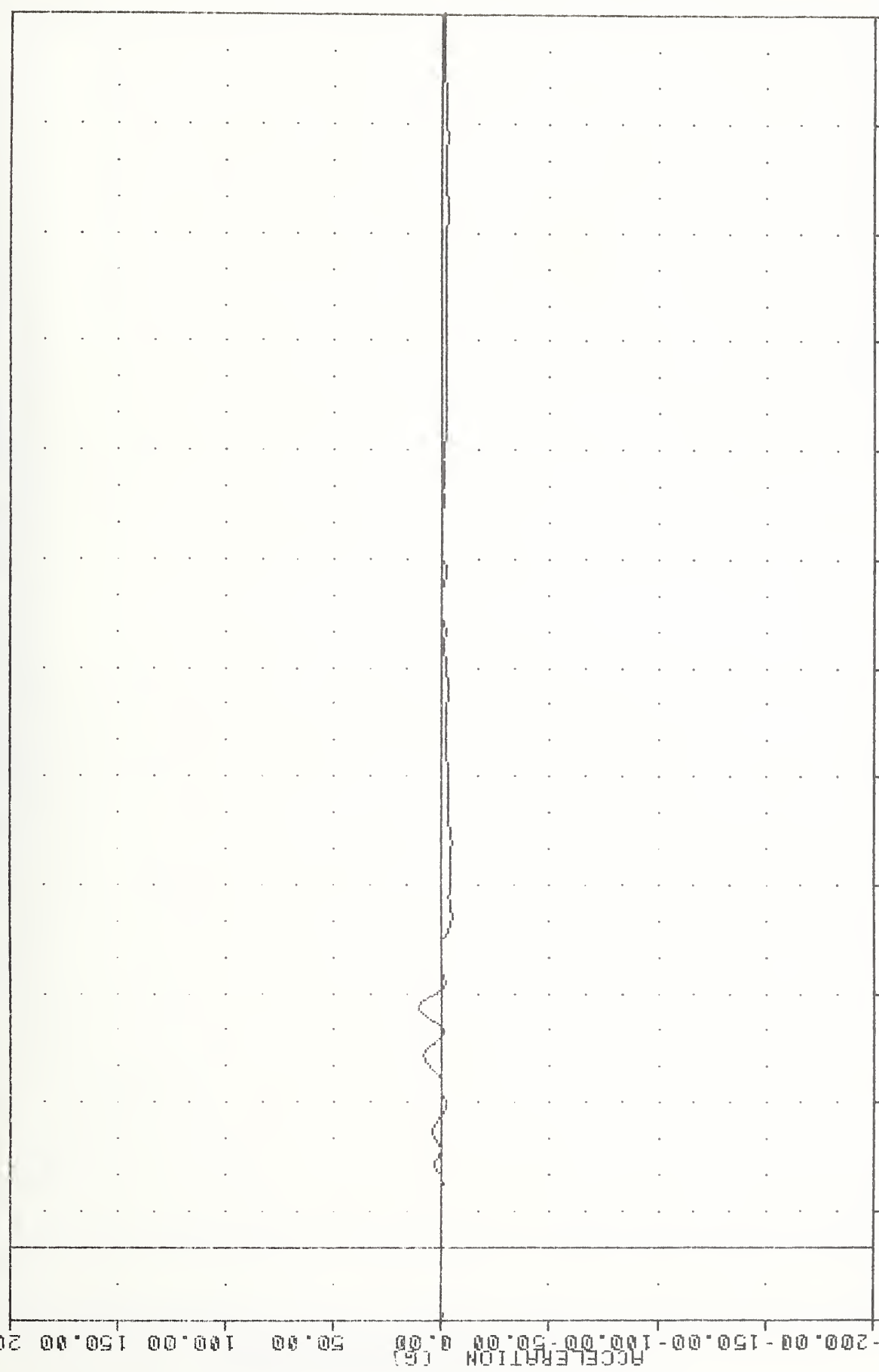
PLU1 DR1c 24-MUB-04 00:24:20
 FILTER = HSRI 136/ 109/ -50
 MIN. MAX VALUES = -17.63e 113.13, 64.35 e 40.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER UPPER SPINE ACCELERATION -2 Y AXIS

INC 840810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 101761

PLU1 DATE 24-AUG-04 WO:24:20
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -4.620 90.62, 10.69 0 65.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER UPPER SPINE ACCELERATION Z AXIS

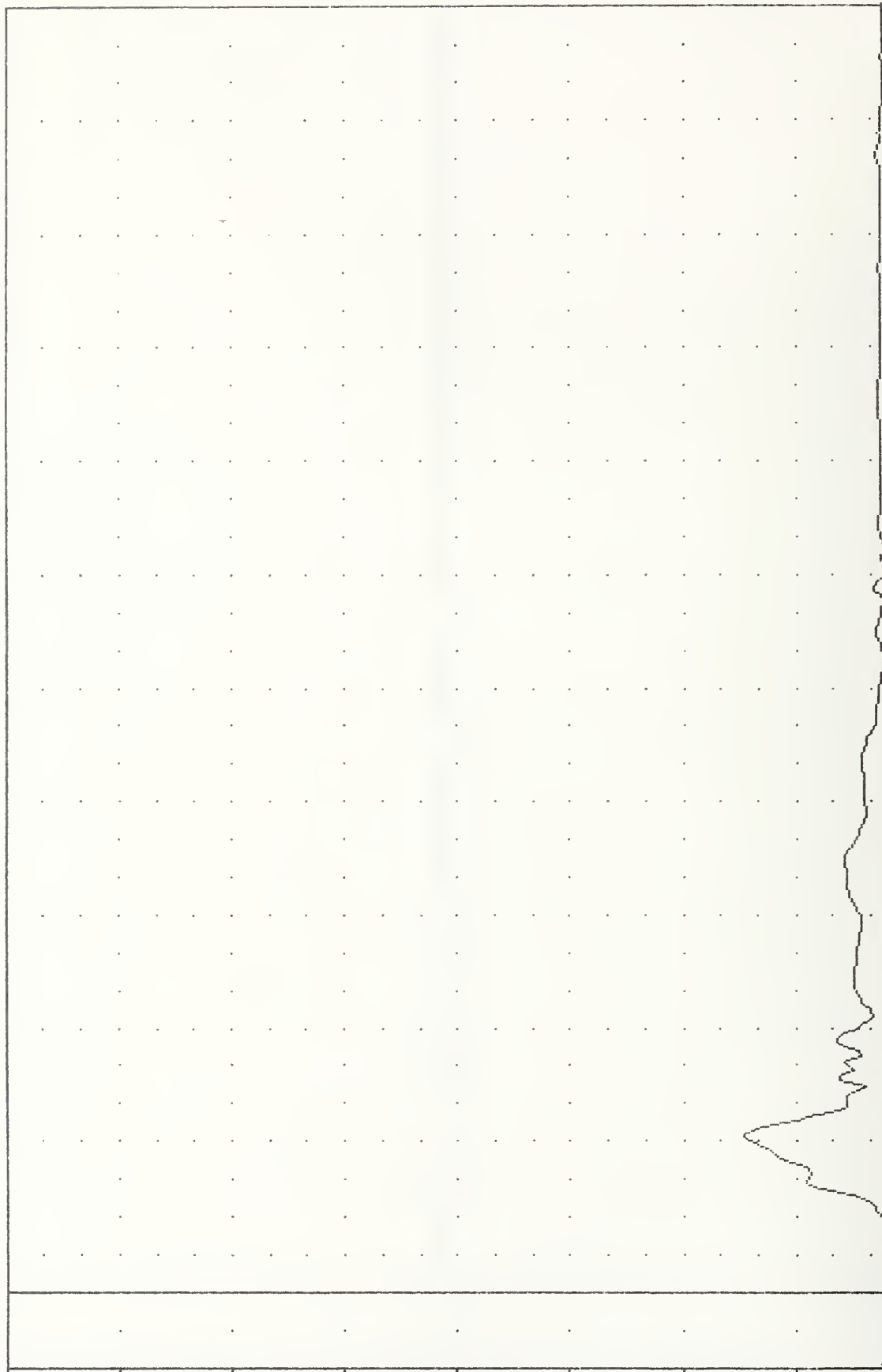
INC , 040810
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 T01RG1

FLU1 DR1C 24-AUG-04 00:24:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.18 15.63, 63.06 40.63

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER UPPER SPINE RESULTANT

INL ,040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T01RGA

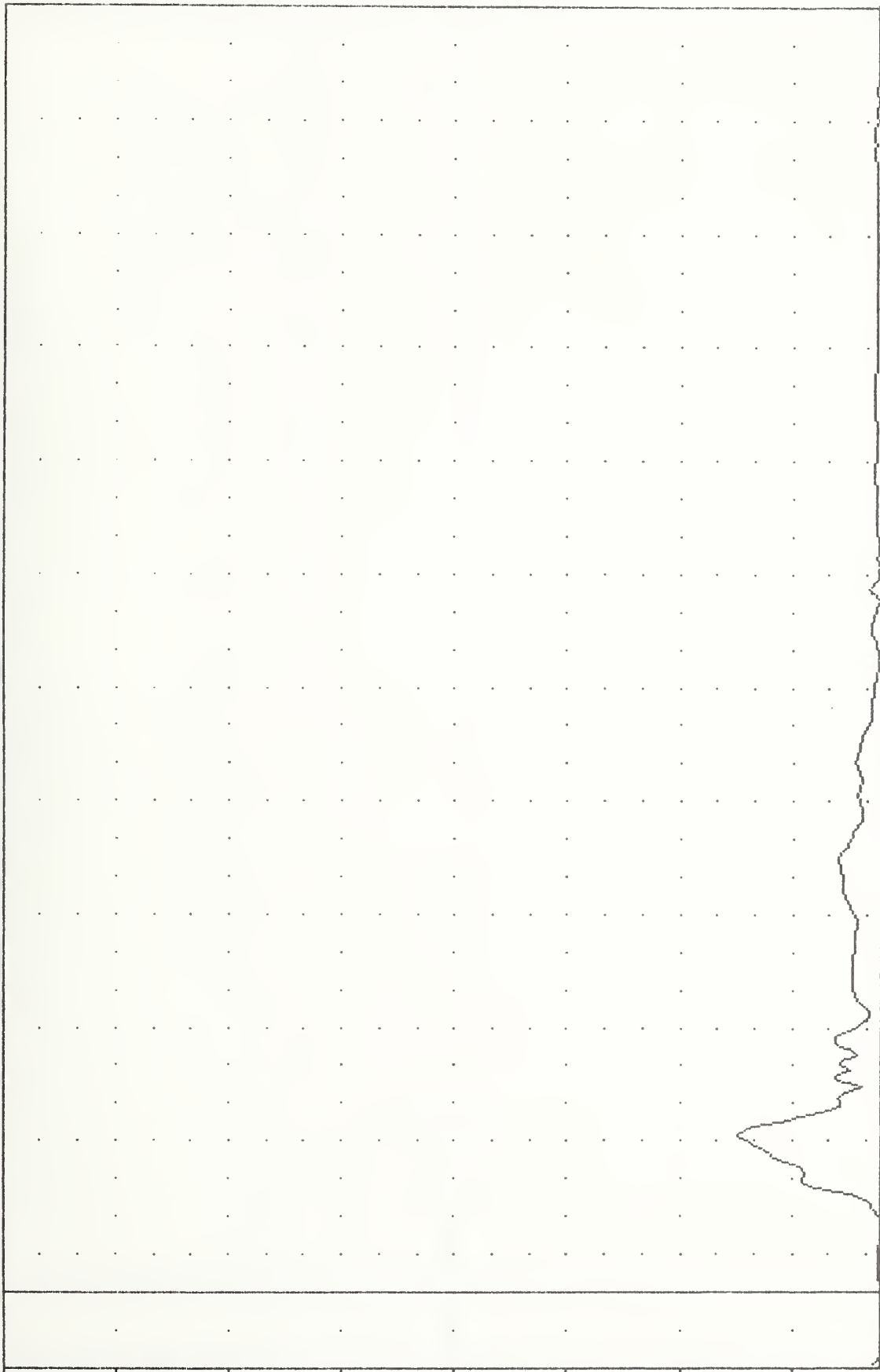
FLUT DRIC 24-AUG-04 00:25:30

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.068

15.63, 64.36 40.63

ACCELERATION (G)



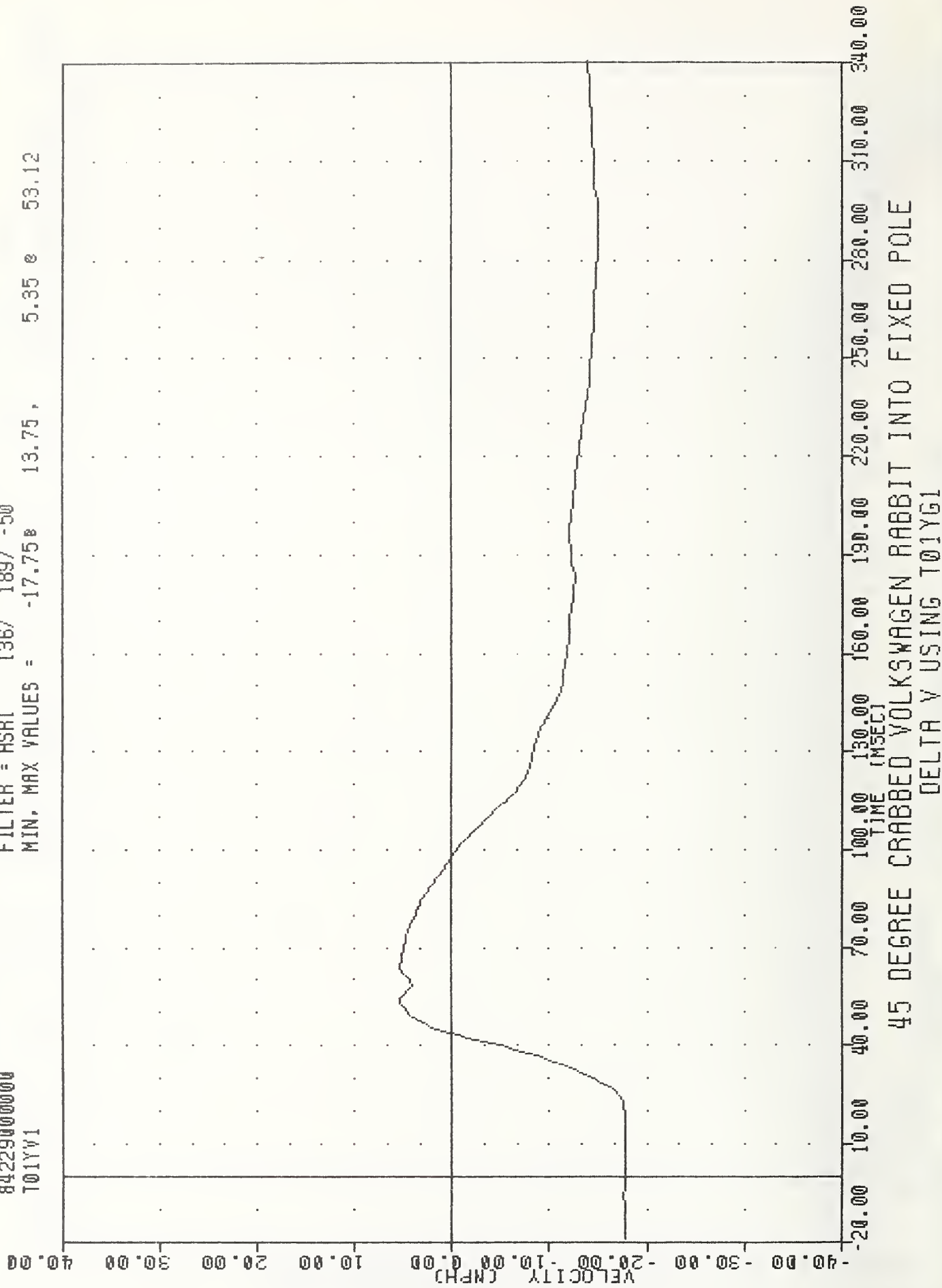
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER UPPER SPINE RESULTANT USING T01YGA

inc 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T01YV1

PLU: DATE 24-AUG-04 11:29:40

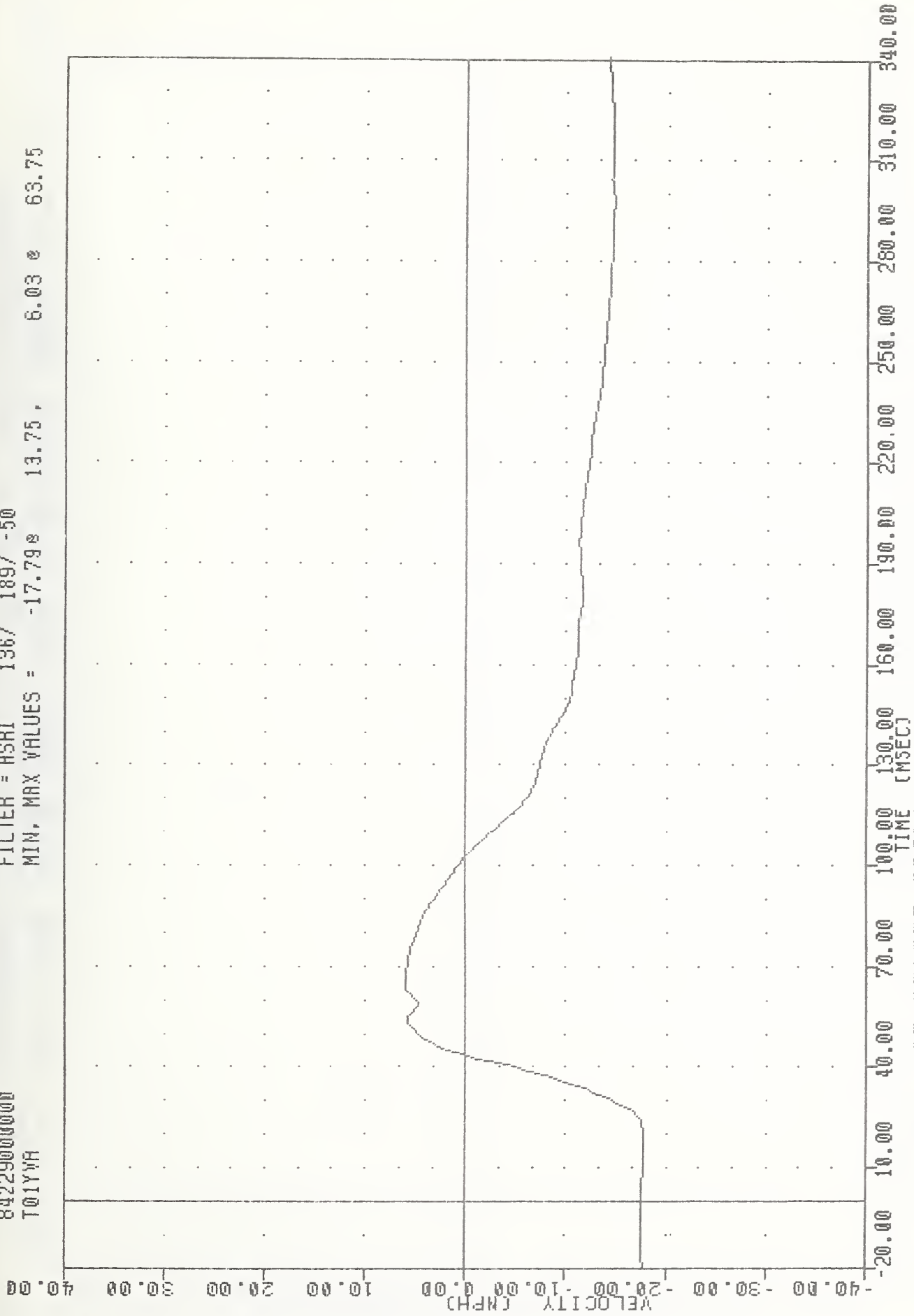
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -17.75 13.75, 5.35 53.12



7K6
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T01YVA

PLU1 DATE 24-MUG-84 11:29:48

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -17.798 13.75, 6.03 63.75



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING T01YGA

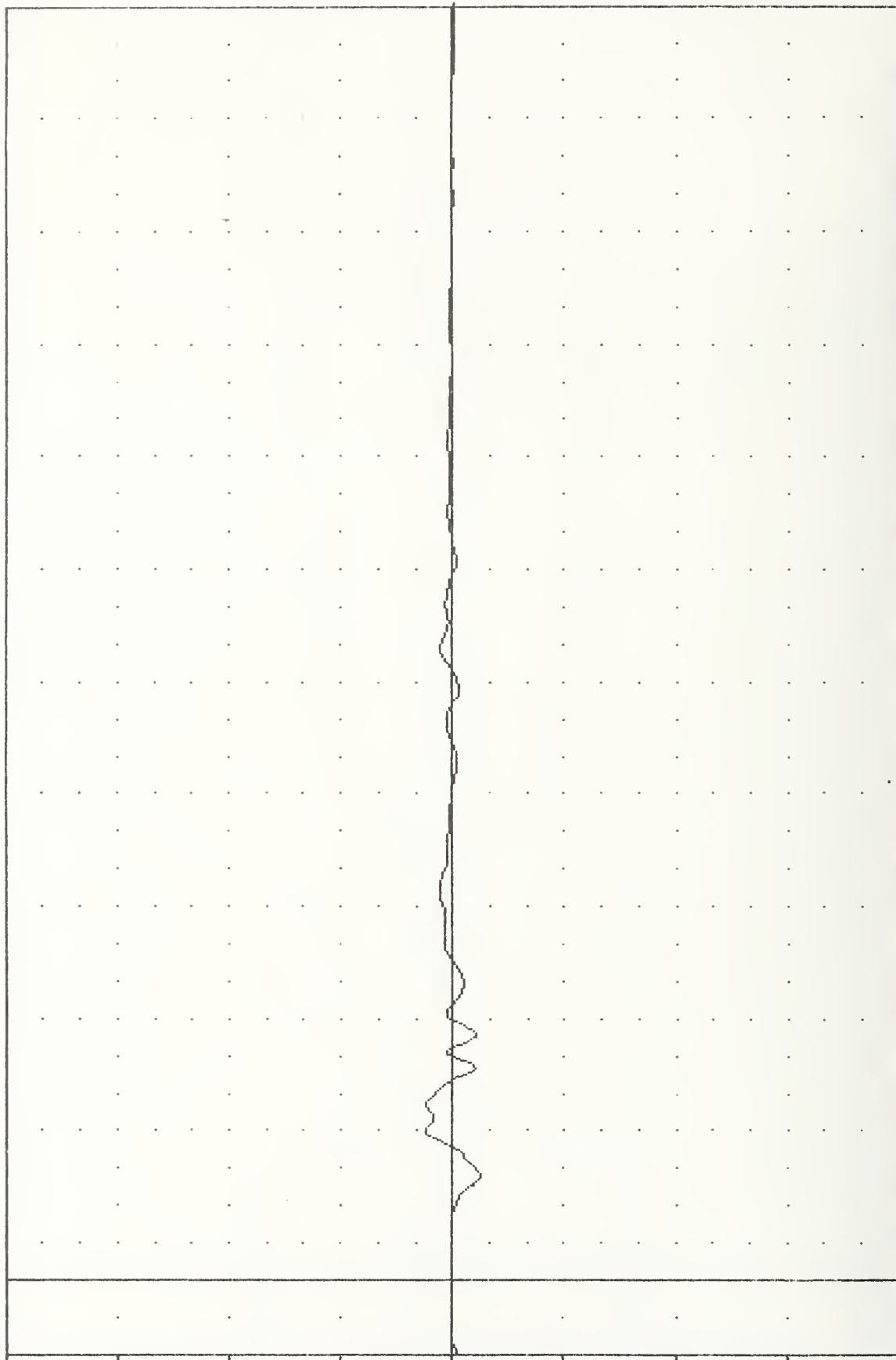
700 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12XG1

PLU1 DR1C 24-11UG-04 W0.24:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -12.710 27.50, 12.27 0 39.38

ACCELERATION (G)

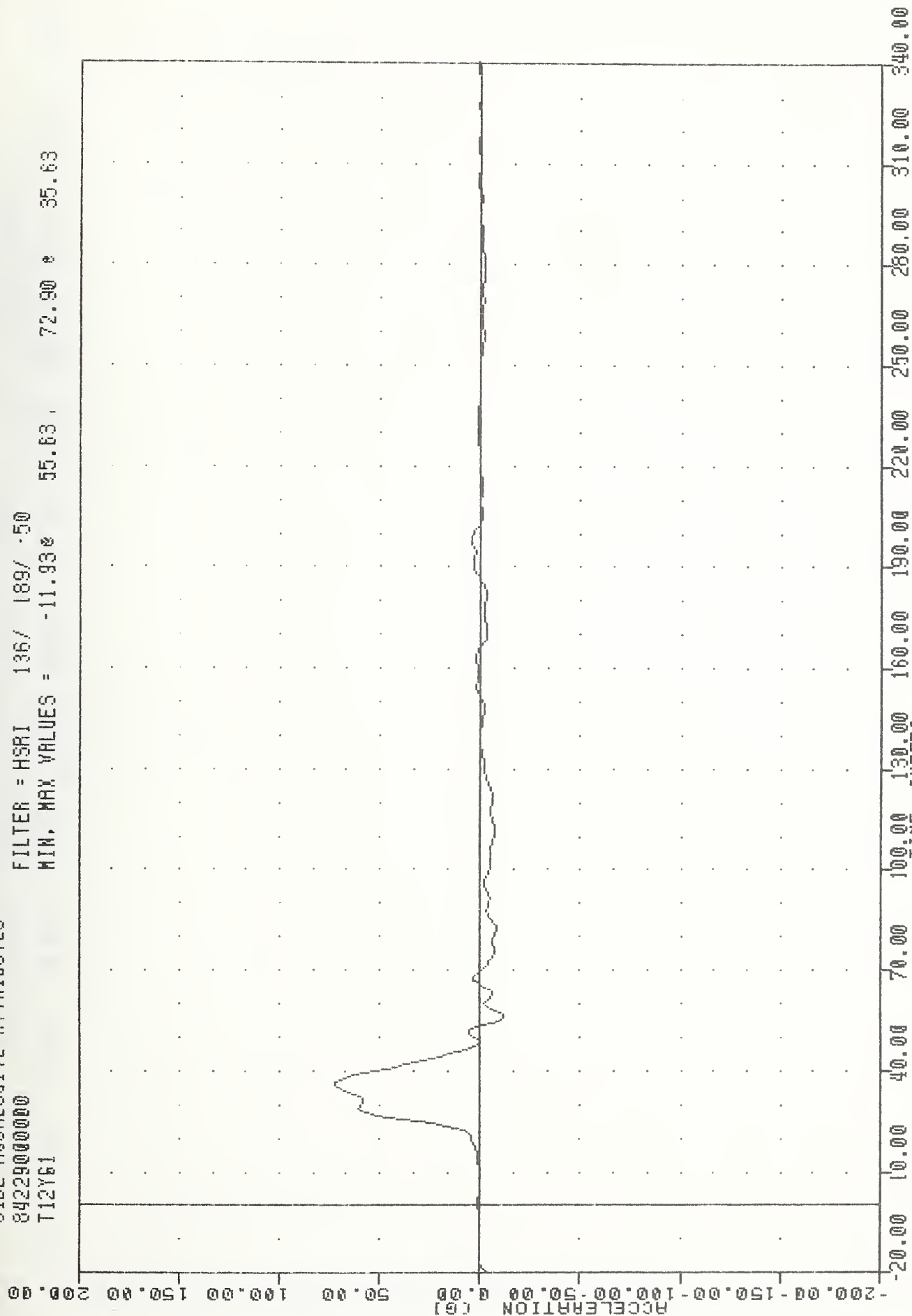


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LOWER SPINE ACCELERATION X AXIS

TIN 040810
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 T12Y61

PLU, DRIL 2* 106-04 00.24120

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -11.930 55.63 72.90 * 35.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LOWER SPINE ACCELERATION Y AXIS

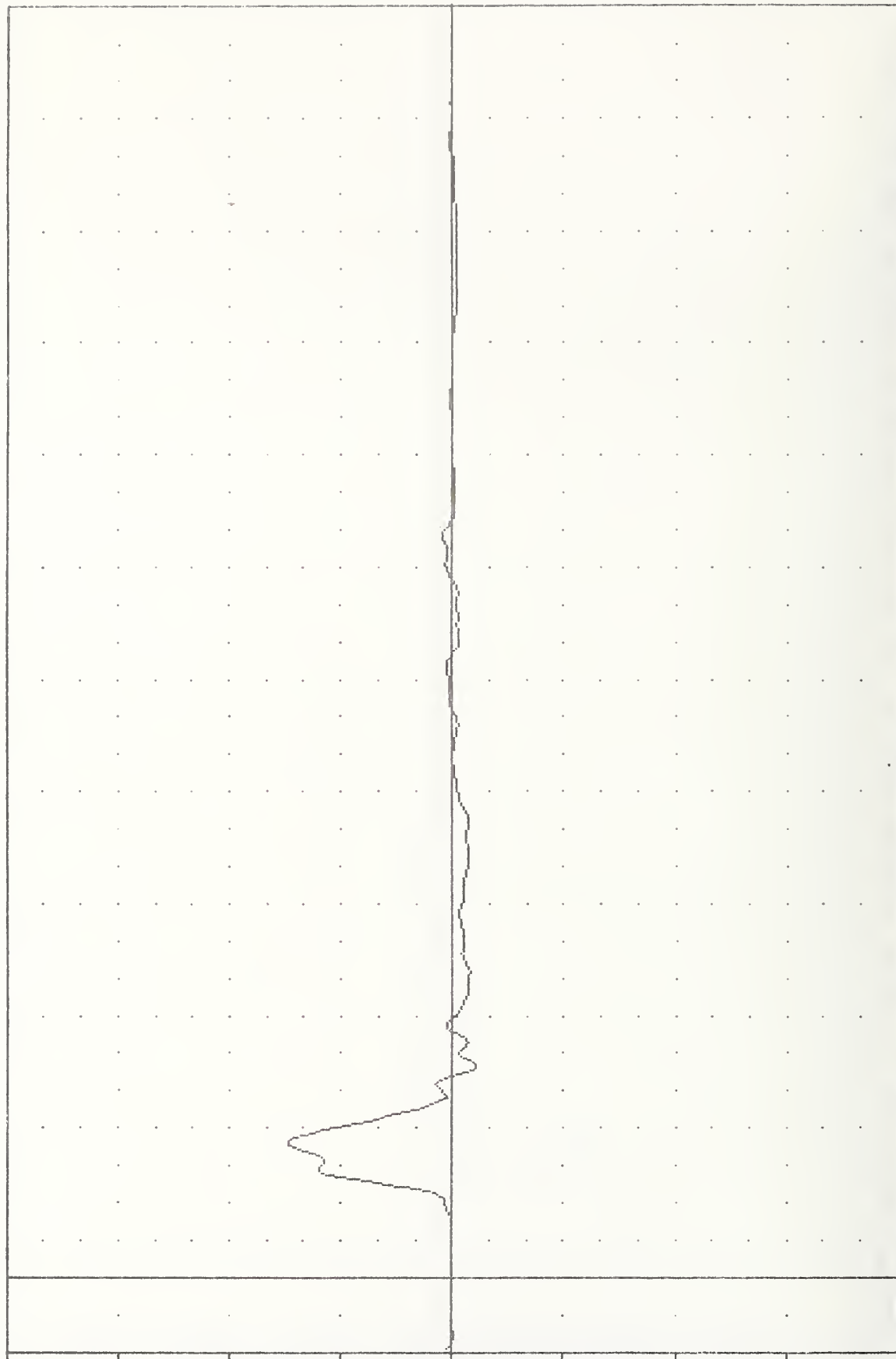
INC , 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12YGR

PLU1 DATE 24 AUG 04 00:24:20

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -10.548 55.63, 73.34 0 35.63

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

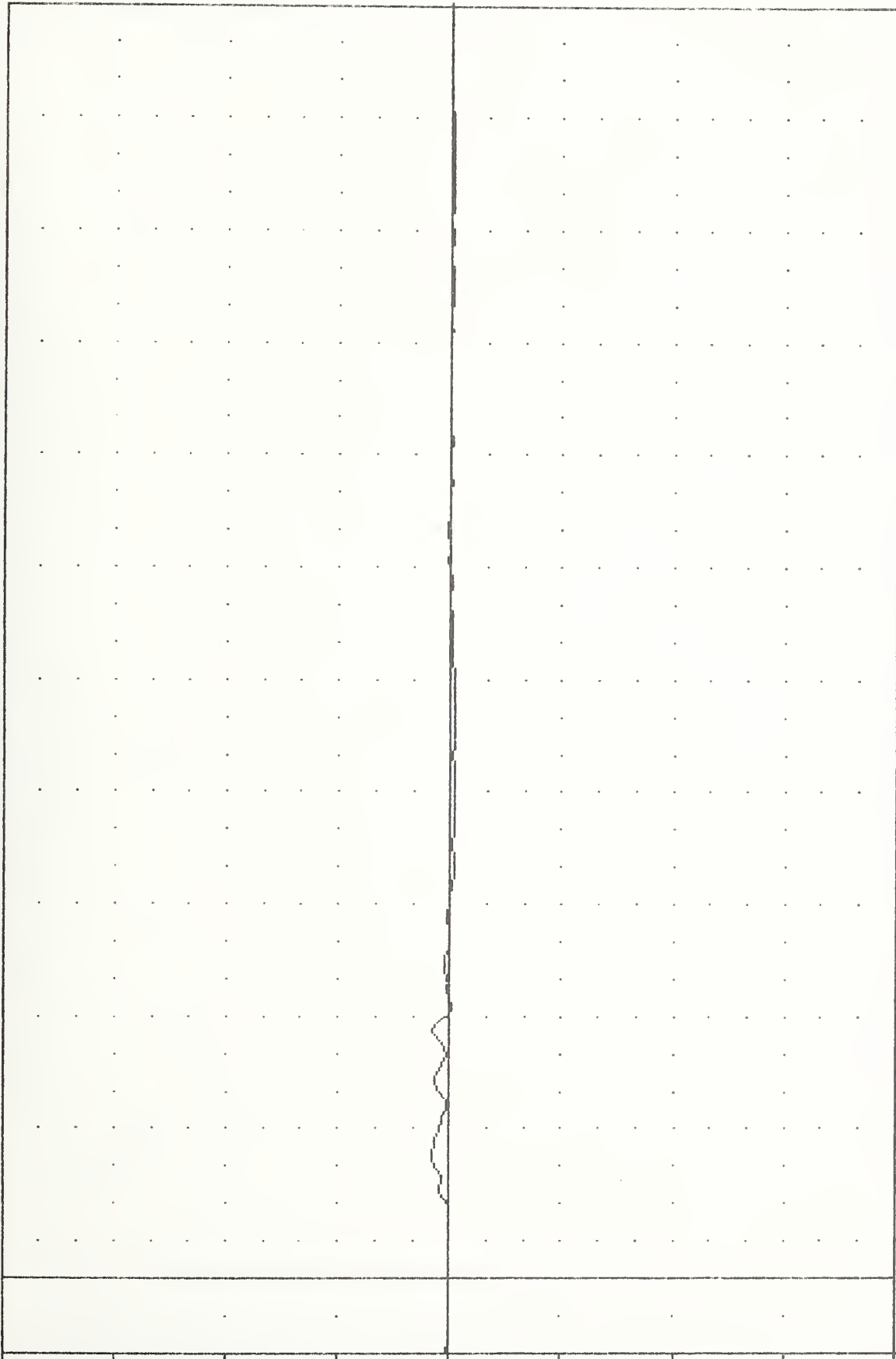
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LOWER SPINE ACCELERATION #2 Y AXIS

TIME 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T127G1

FLOR DAIRL 23 JUL 68 03 00.24:20

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -2.260 133.75, 7.63 31.88

ACCELERATION (G)



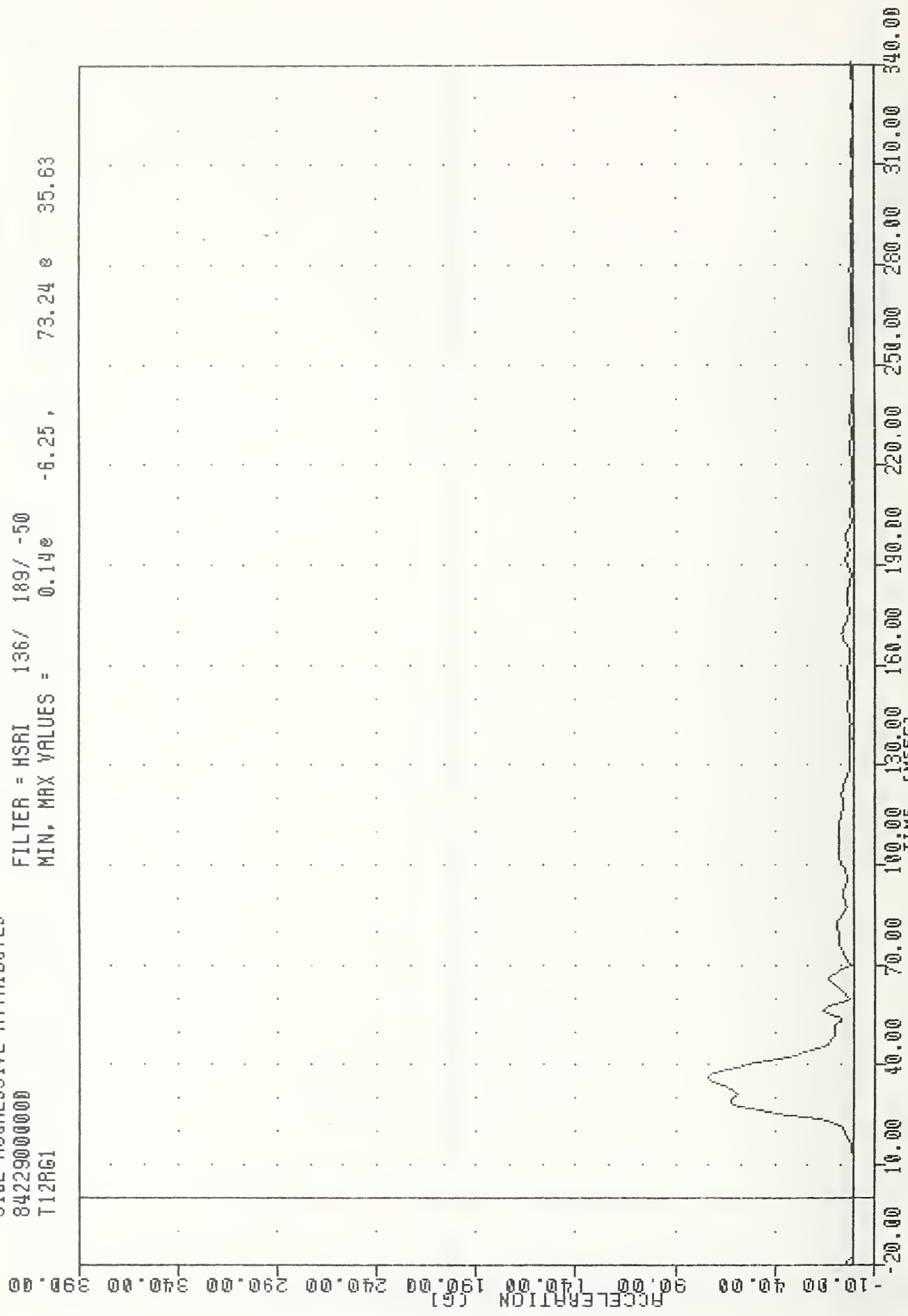
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LOWER SPINE ACCELERATION Z AXIS

INC 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12RG1

PLU: DRIL 2* JUG-U* WU.24:20

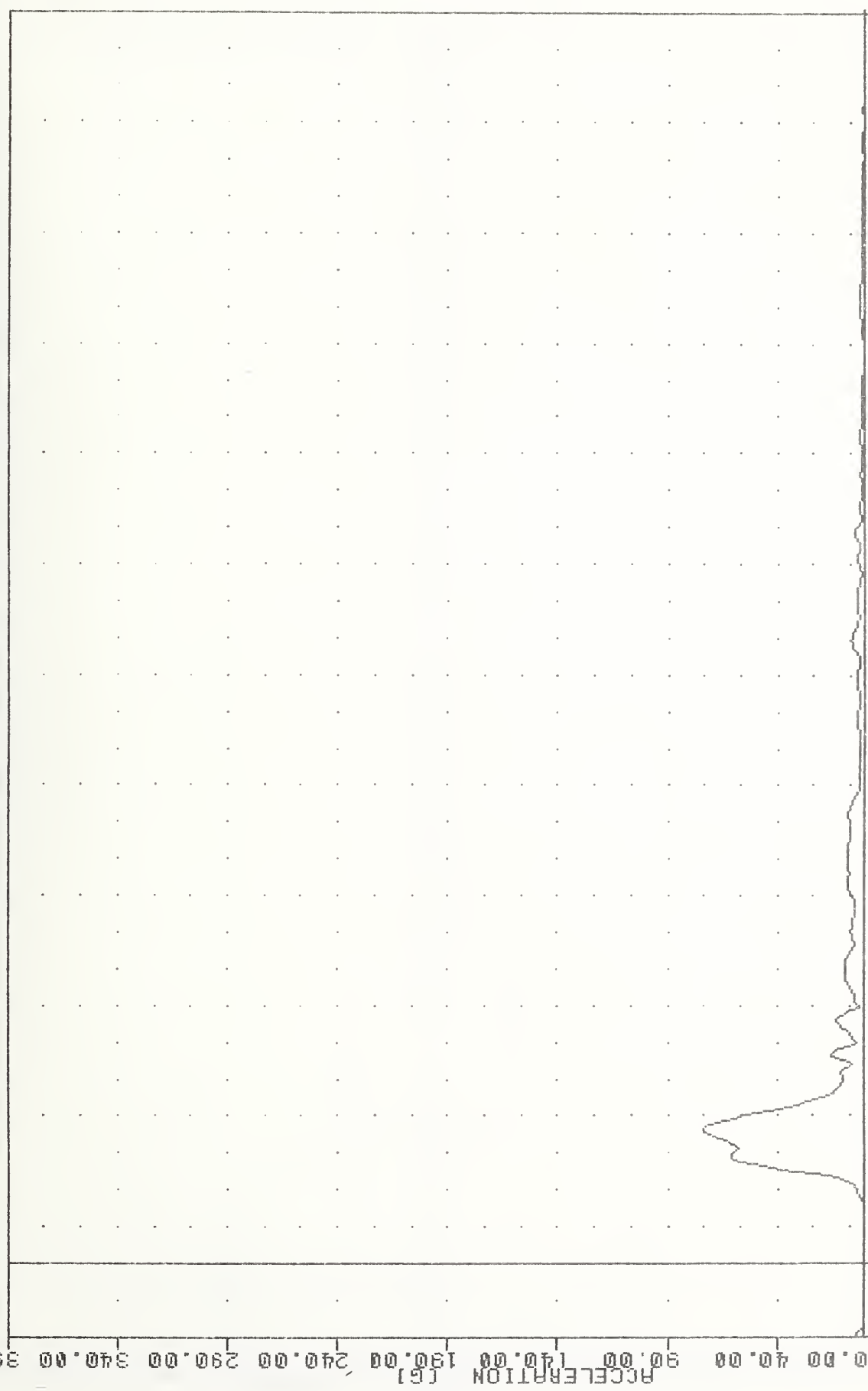
FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.14e -6.25, 73.24 e 35.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LOWER SPINE RESULTANT

THU , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 T12RGA

PLU1 DR1E 24-MUG-84 08:25:38
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.18e -5.00, 73.67 e 35.63

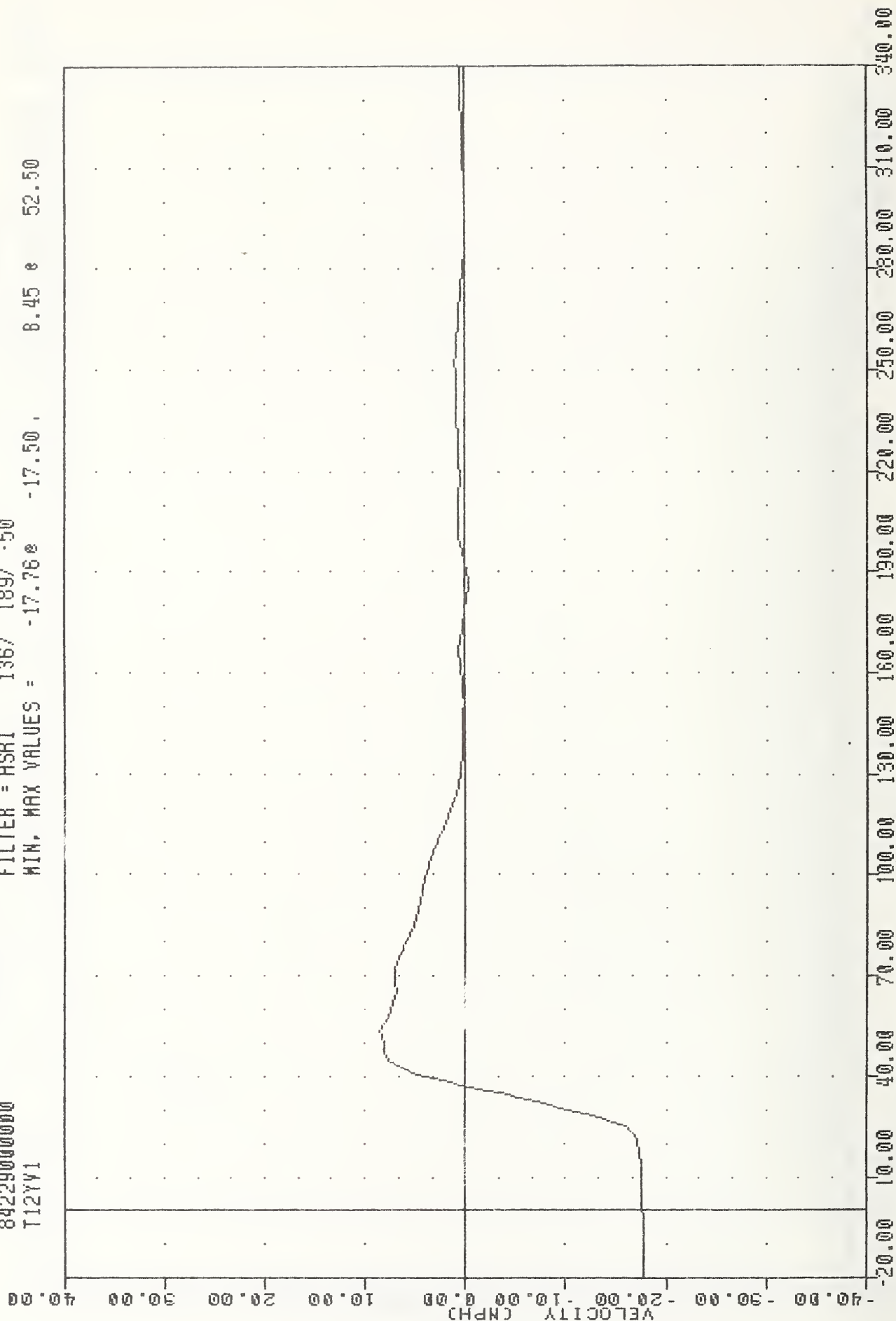


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LOWER SPINE RESULTANT USING T12YGA

THU 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T12YV1

PLU1 DATE 24-HUG-84 11:29:48

FILTER = HSRI 136/ 189/ .50
MIN. MAX VALUES = -17.76e -17.50 , 8.45 e 52.50



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING T12YGI

PLU1 DATE 24-MUG-84 11:29:48

7HC , 840816

SIDE AGGRESSIVE ATTRIBUTES

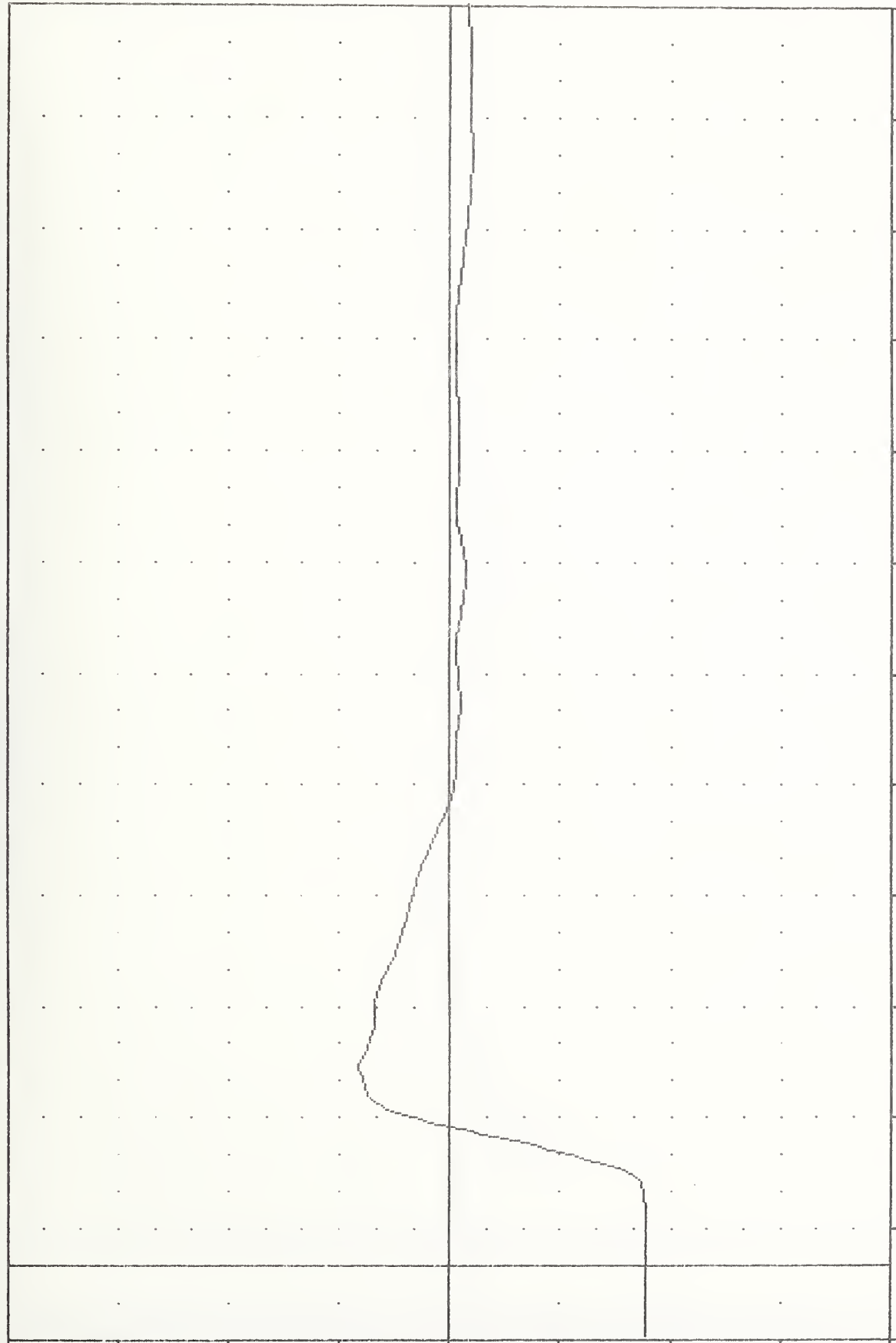
842290000000

T12YVA

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.738 6.88 , 8.25 8 53.12

VELOCITY (MPH)



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING T12YGA

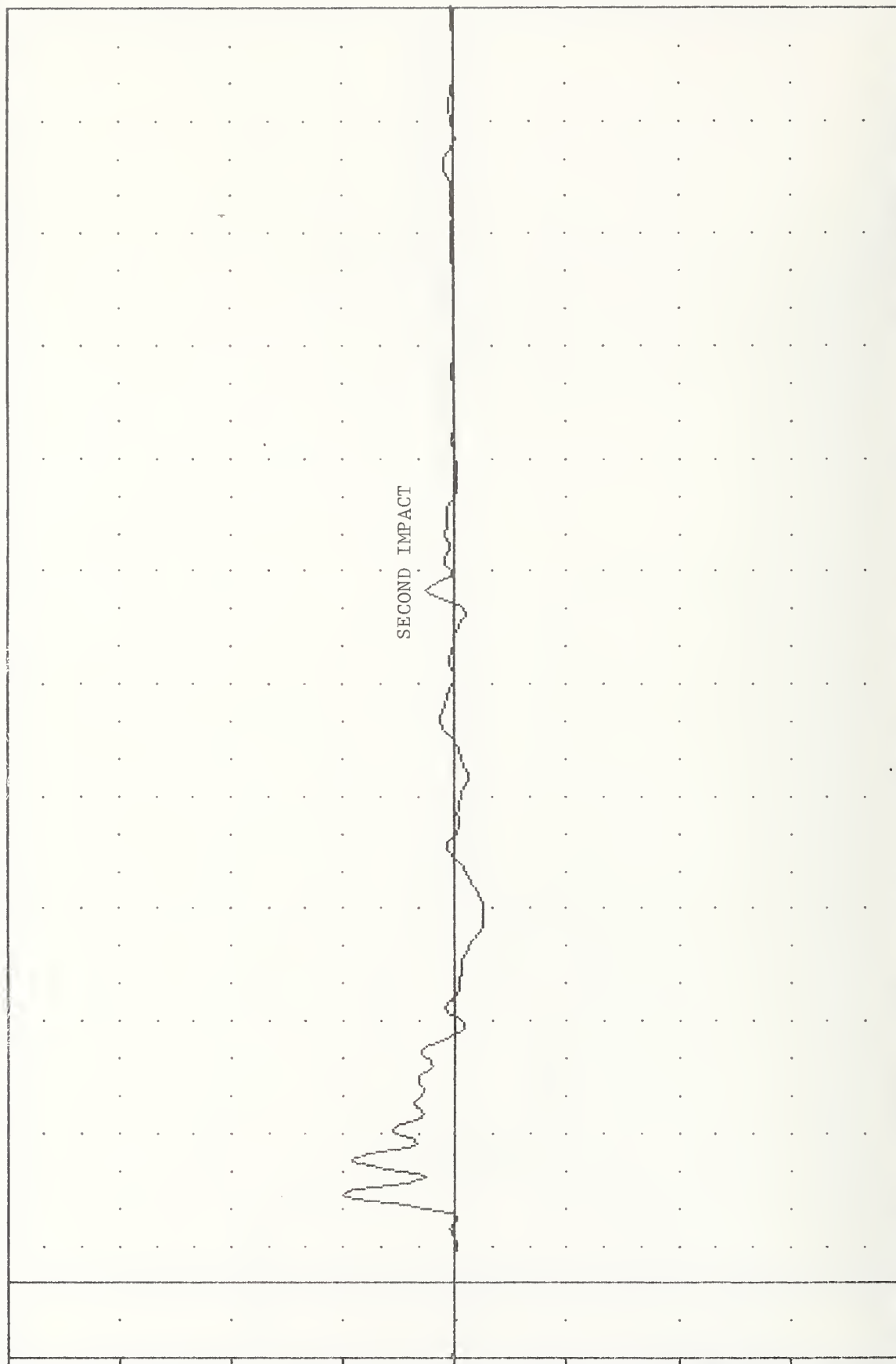
TAC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LURY61

PLUI DATE 24-AUG-84 08:24:26

FILTER = HSSI 136/ 189/ -50

MIN, MAX VALUES = -12.96 96.25 50.55 23.13

ACCELERATION (G)



SECOND IMPACT

TIME (msec) 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

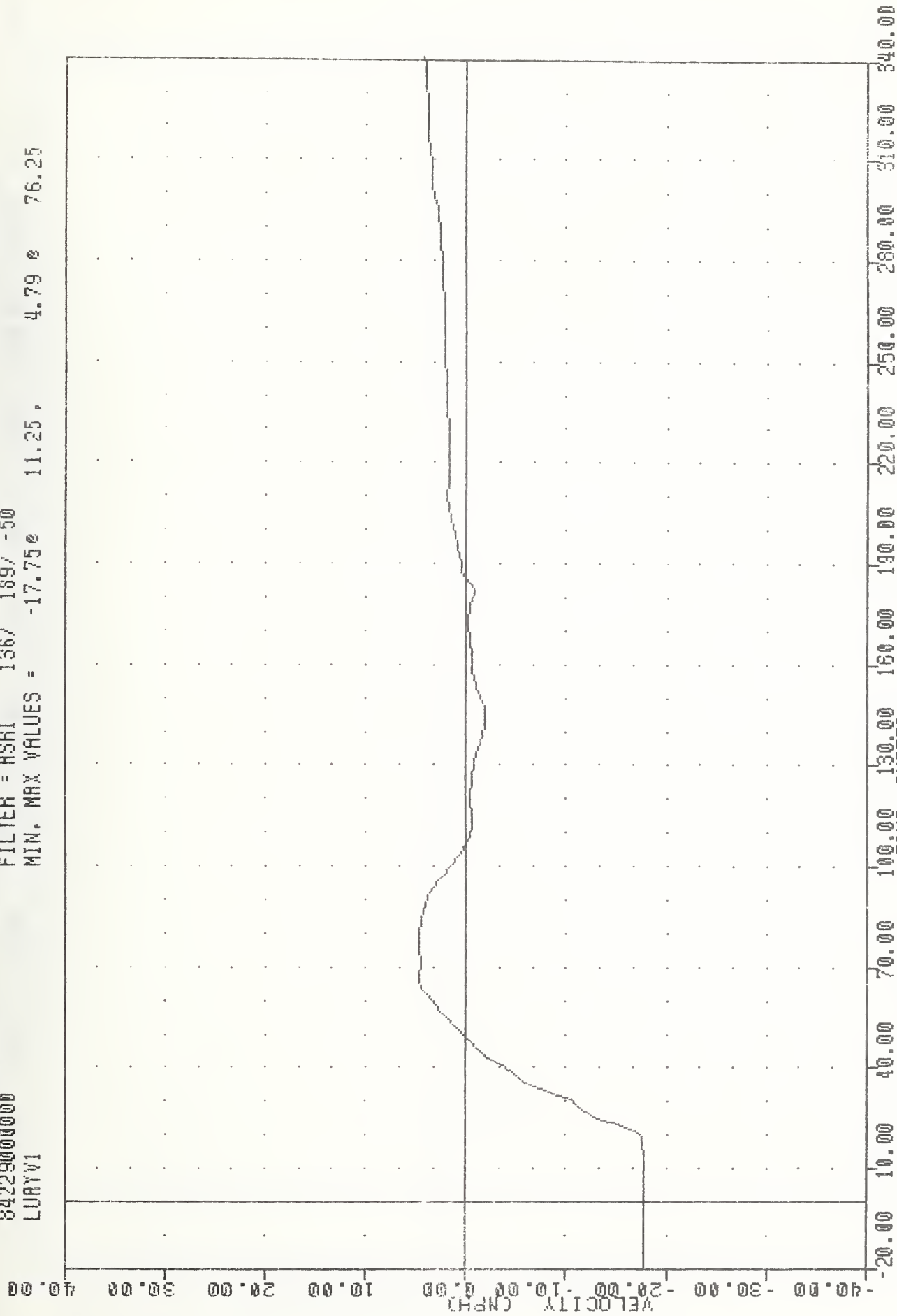
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

TRC .840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LURYV1

PLU1 DATE 24-MUG-84 11:29:48

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.750 11.25, 4.79 0 76.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LURY61

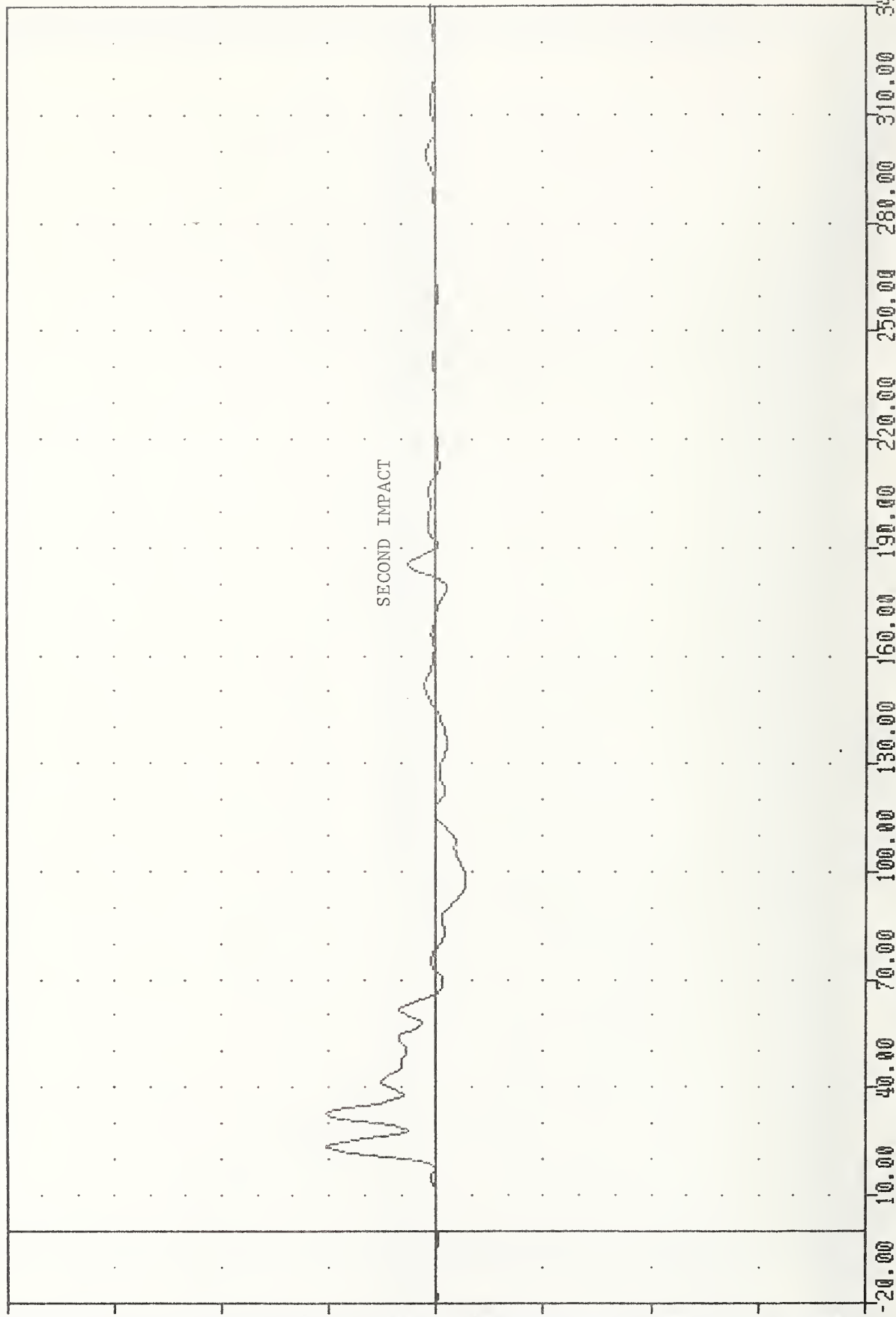
JHC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LURYGA

PLUI DATE 24-HUG-84 08:24:26

FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = -14.00E 96.88, 51.04 @ 23.13

ACCELERATION [G]



SECOND IMPACT

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LEFT UPPER RIB ACCELERATION -2 Y AXIS

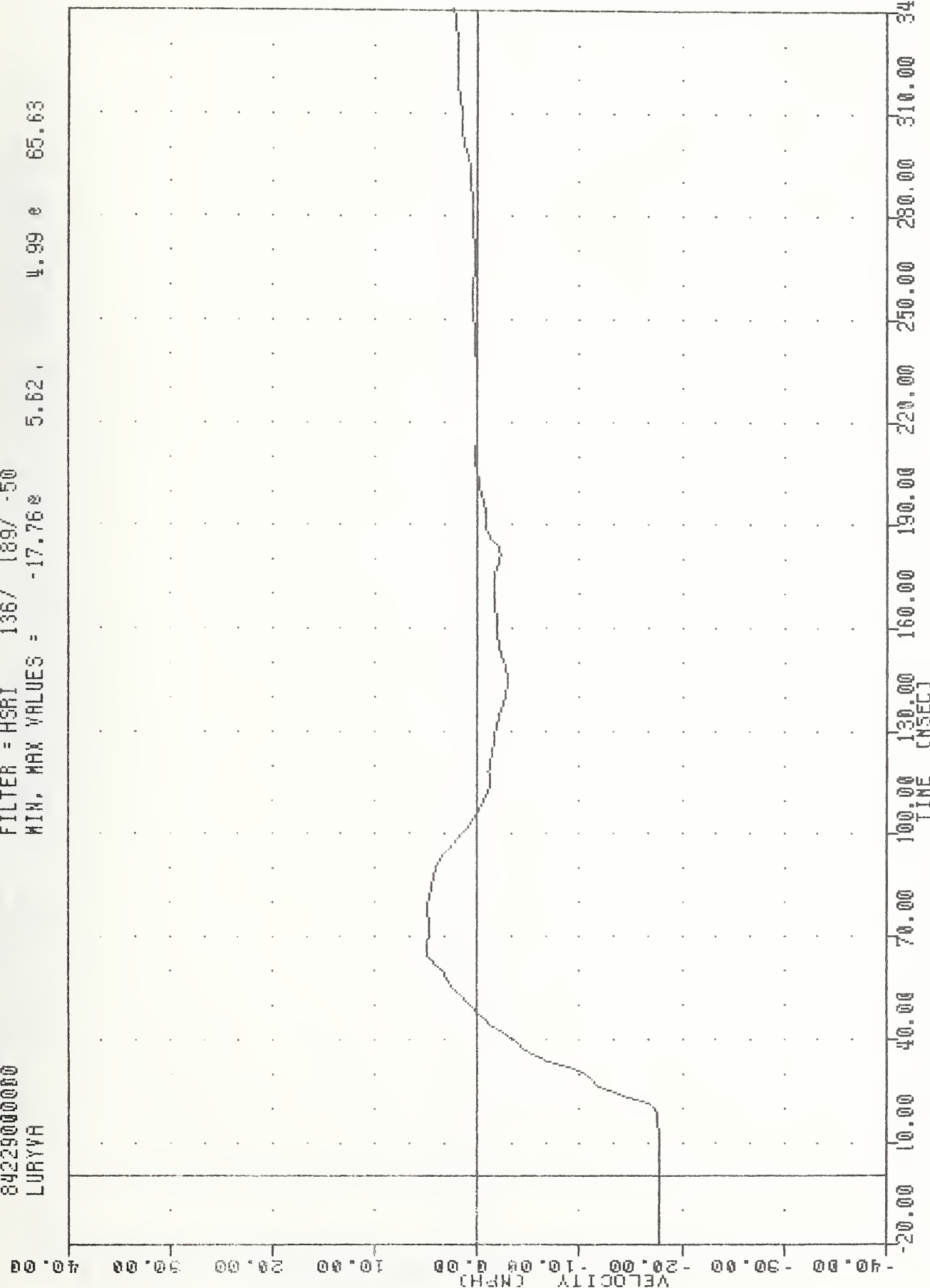
TRC 84081b
SIDE AGGRESSIVE ATTRIBUTES
842290000000
LURYVA

PLU1 DATE 24-mjB-64 11:29:40

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.76 5.62

4.99 65.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LURYGA

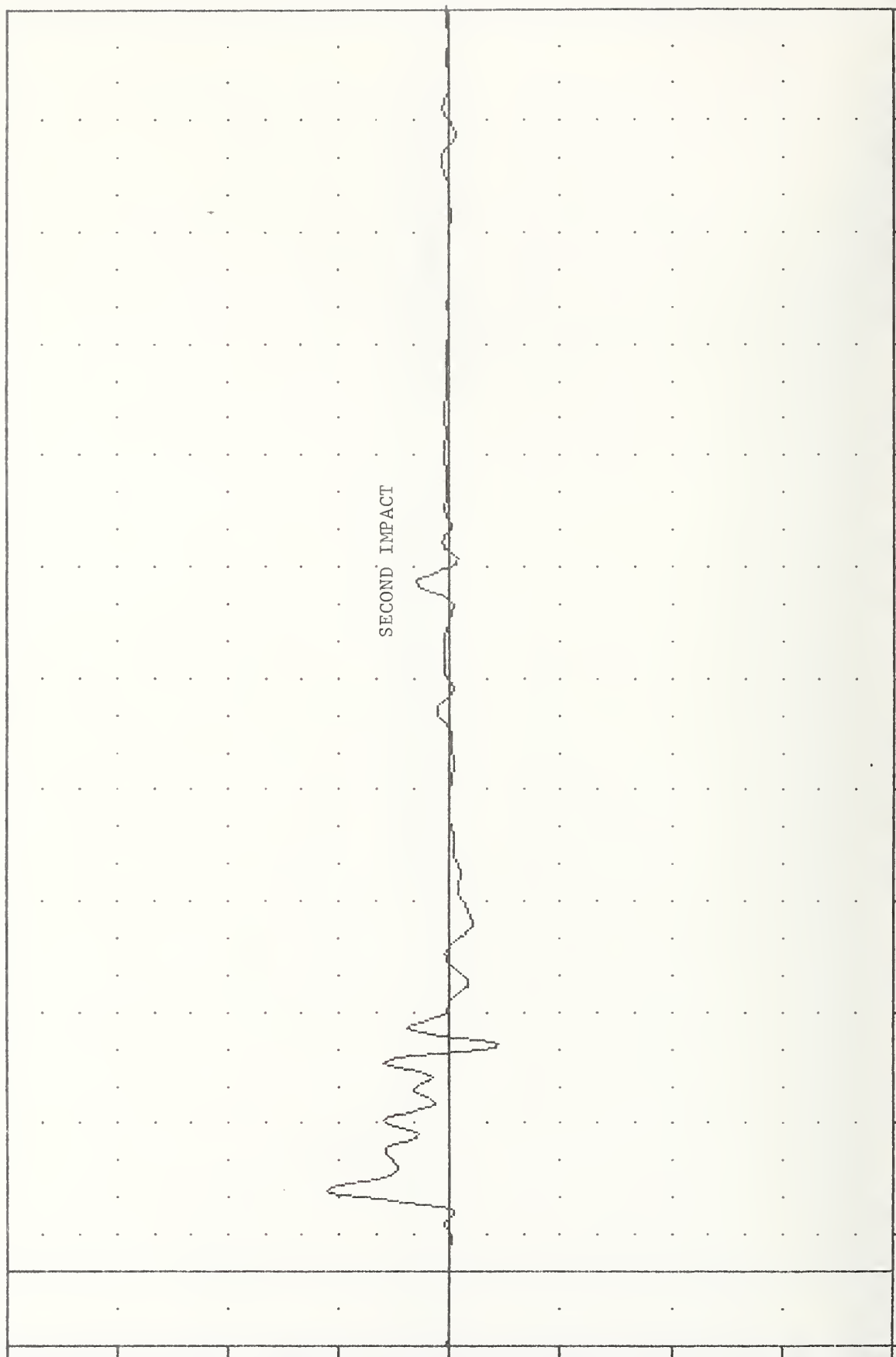
TML
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LLAYG1

PLU1 DATE 24-HUG-84 08:24:26

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -21.960 60.62, 55.80 21.25

ACCELERATION (G)



TIME (MSEC)

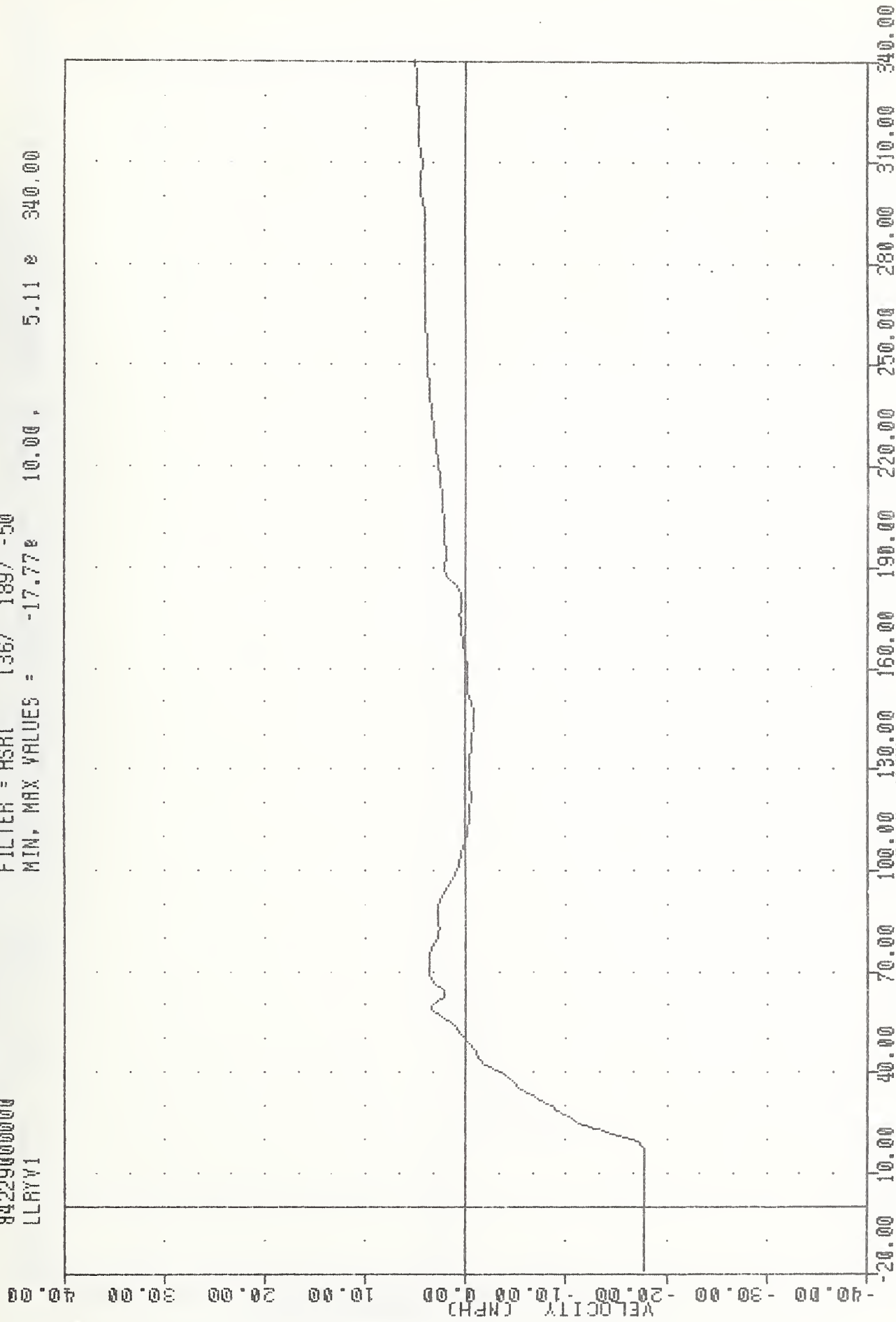
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

7040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LLRYV1

PLV: DRIL 23 AUG 03 11:29:30

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -17.770 10.00, 5.110 340.00



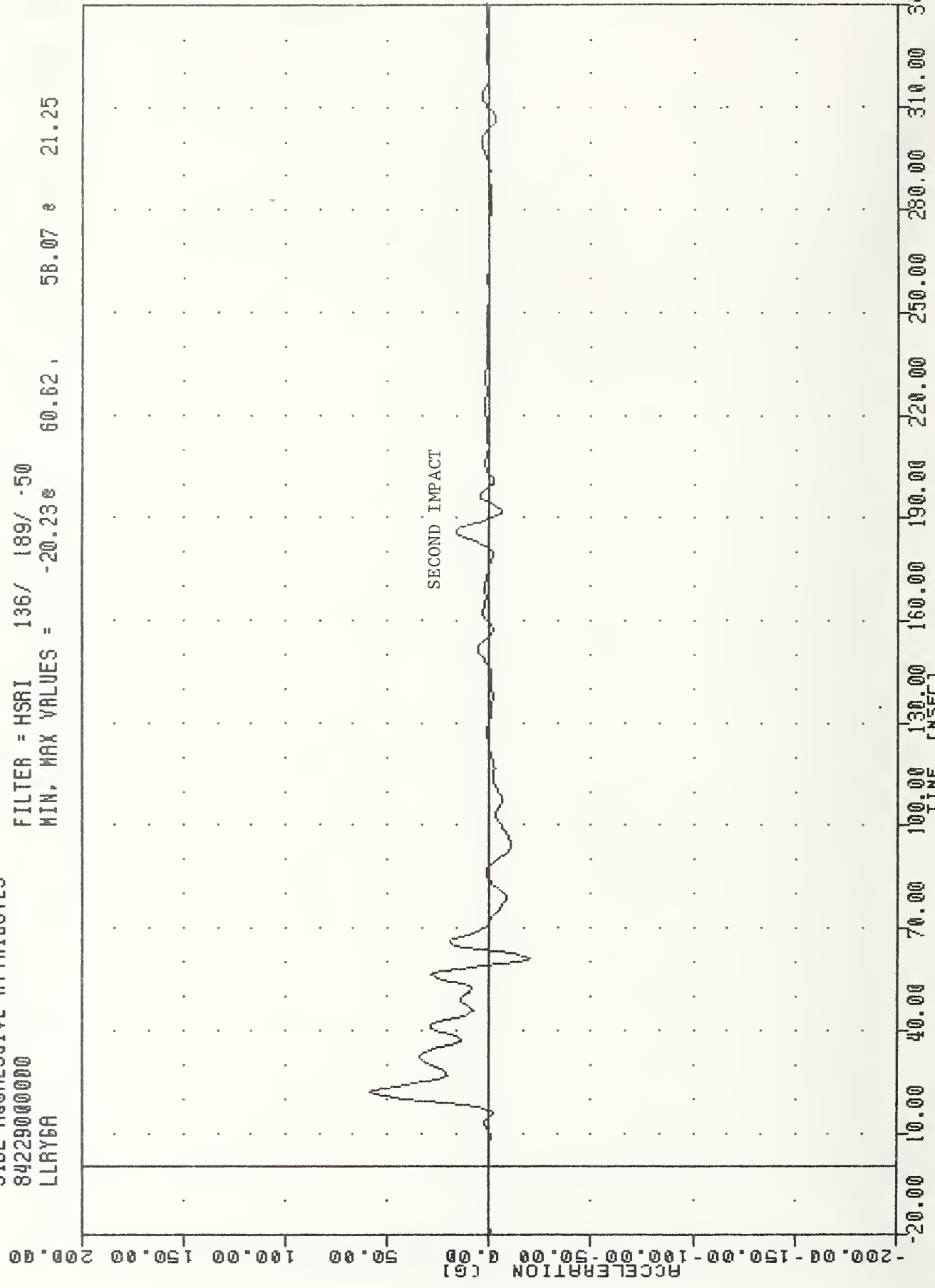
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LLRYG1

THC , 84081b
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LLRY6A

PLU1 DATE 24-MAY-84 08:24:20

FILTER = HSRI 136/ 189/ -50

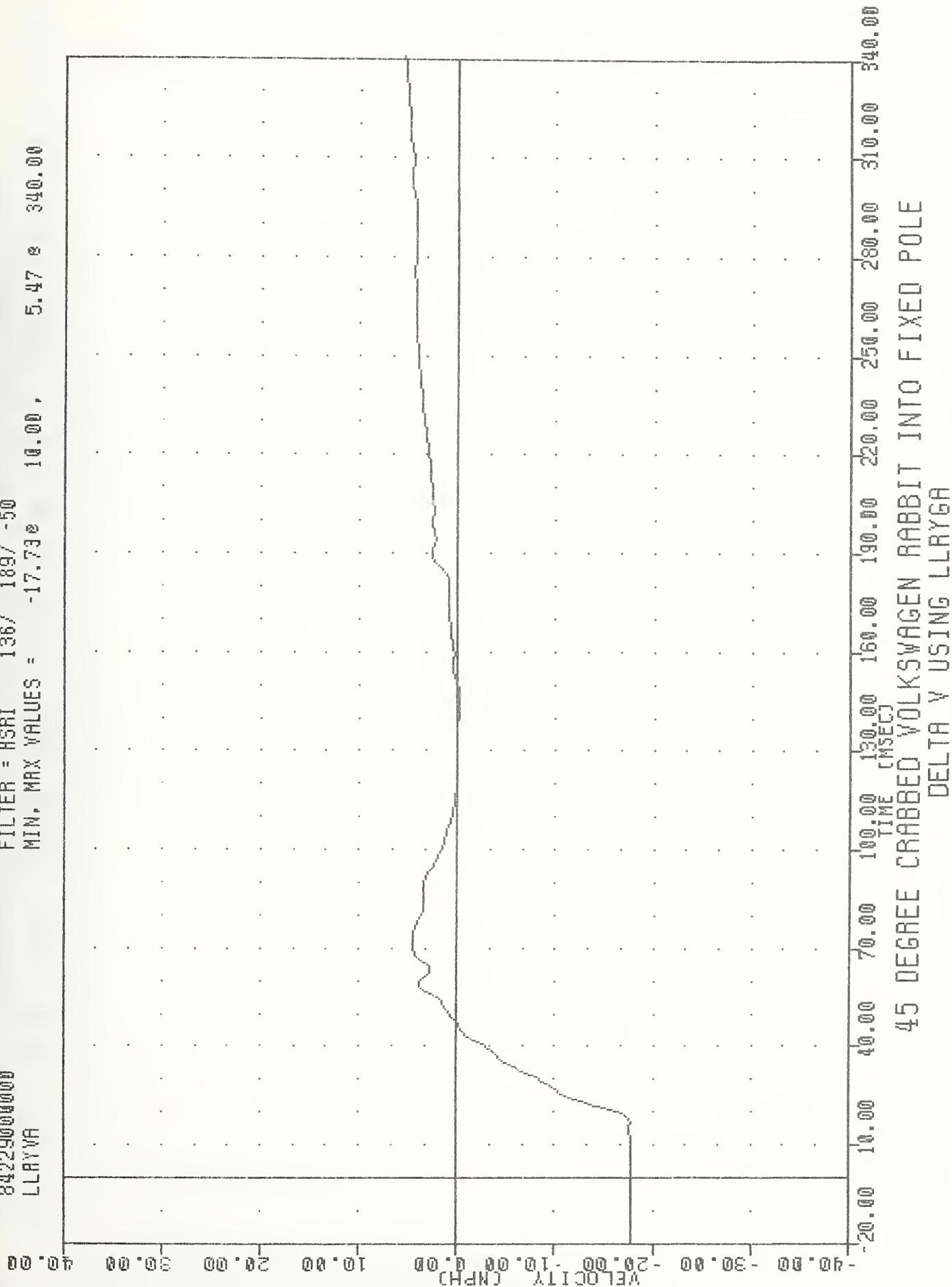
MIN, MAX VALUES = -20.23 60.62 , 58.07 21.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS

TOL 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LLYVA

FLUT DRIL 23 1106-04 11-29:30
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -17.730 10.00, 5.47 340.00



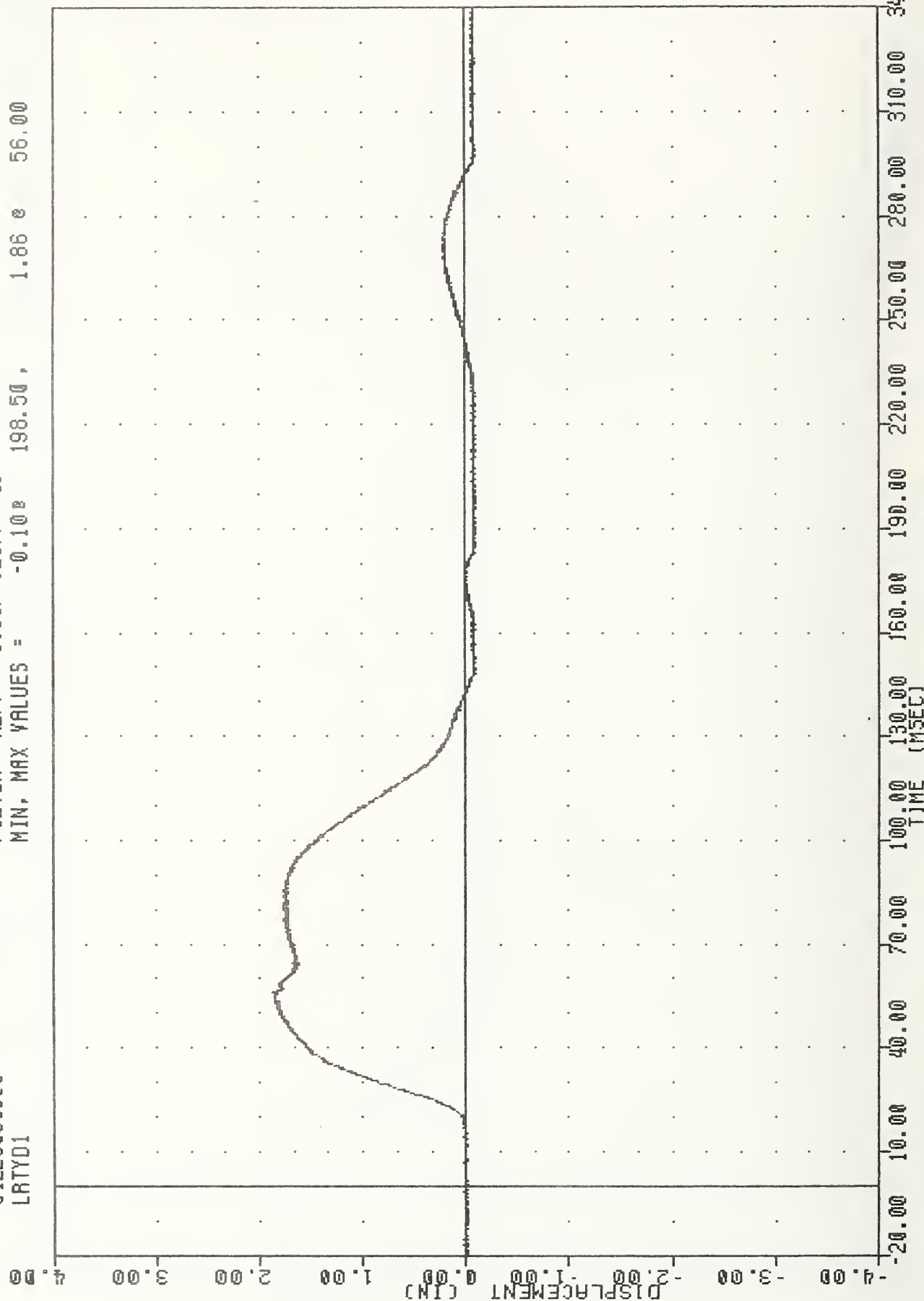
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LLYVA

TRC , 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LRTYD1

PLU1 DATE 24-MUG-84 WD:23:30

FILTER = ALPF 1650/ 5217/ -40

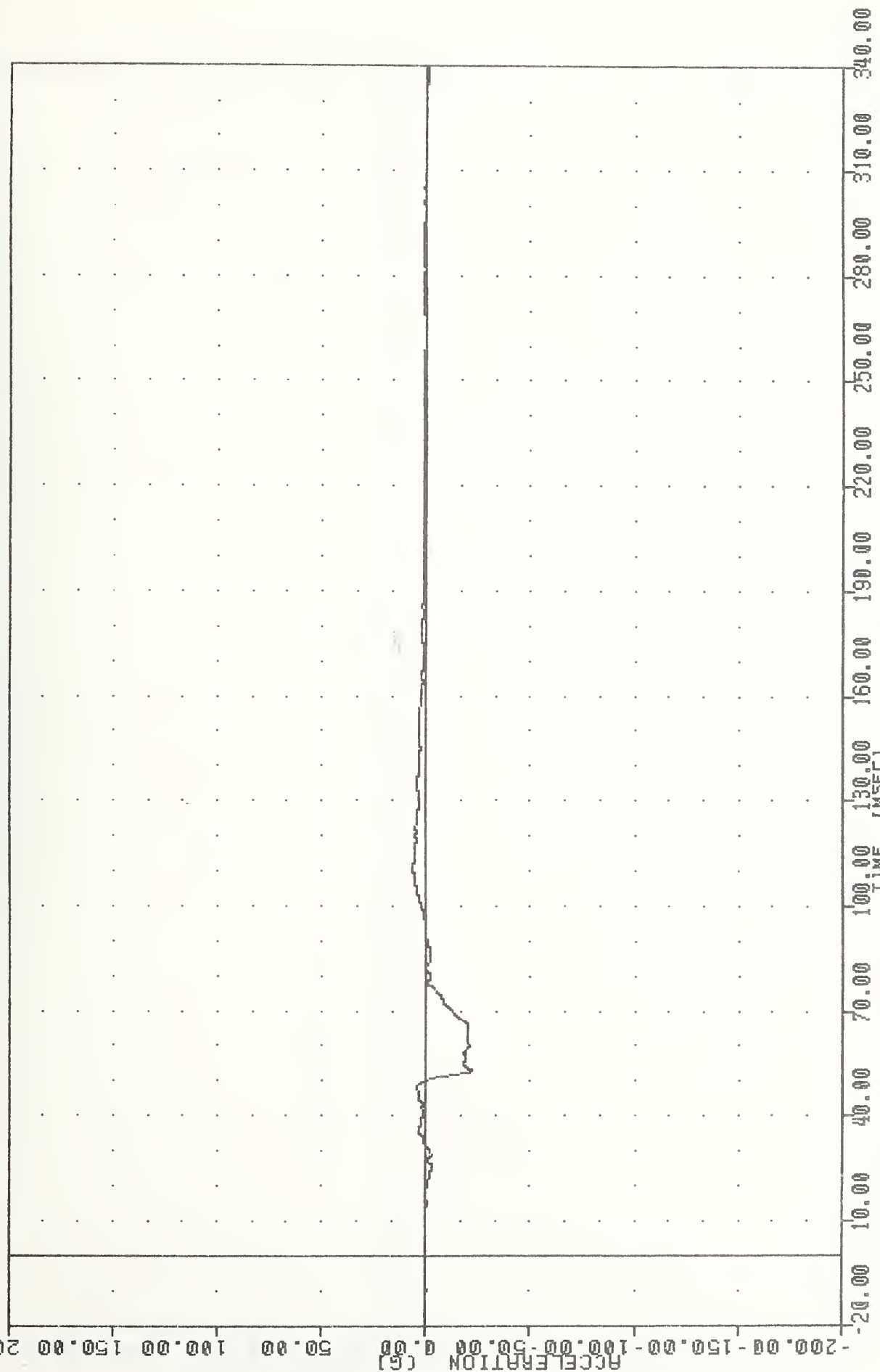
MIN. MAX VALUES = -0.108 198.50, 1.86 56.00



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
DRIVER LEFT RIB TO SPINE DISPLACEMENT INCHES

INC 840810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 PEVXG1

FLUT DRIC 24-AUG-84 08:23:30
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -21.858 52.88, 6.47 110.75



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER PELVIS ACCELERATION X AXIS

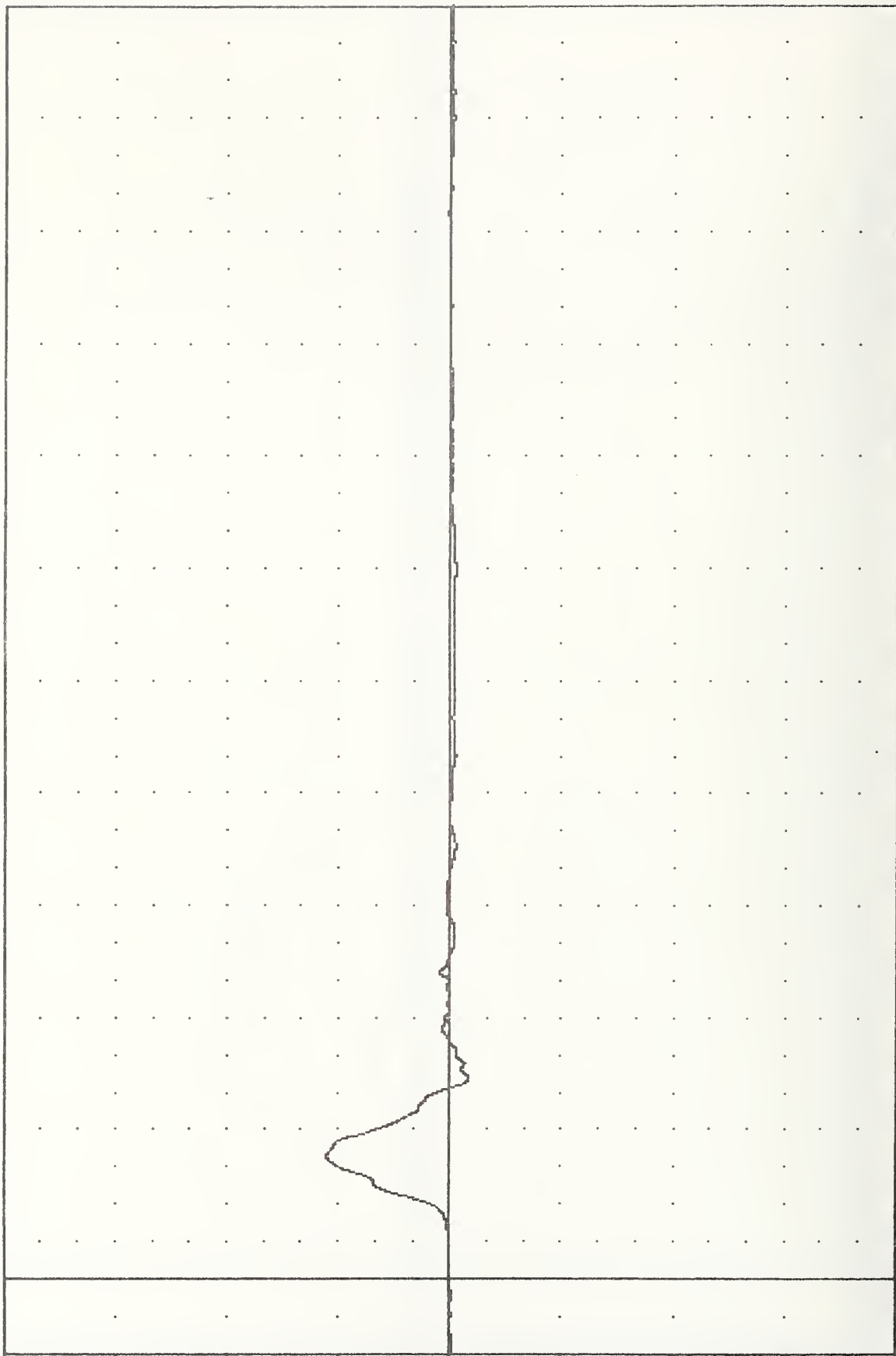
INC , 040816
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 PEVYG1

PLUI DR1E 24-HUG-04 08:23:36

FILTER = 8LPF 300/ 949/ -40

MIN. MAX VALUES = -8.71e 53.50, 55.37 e 32.75

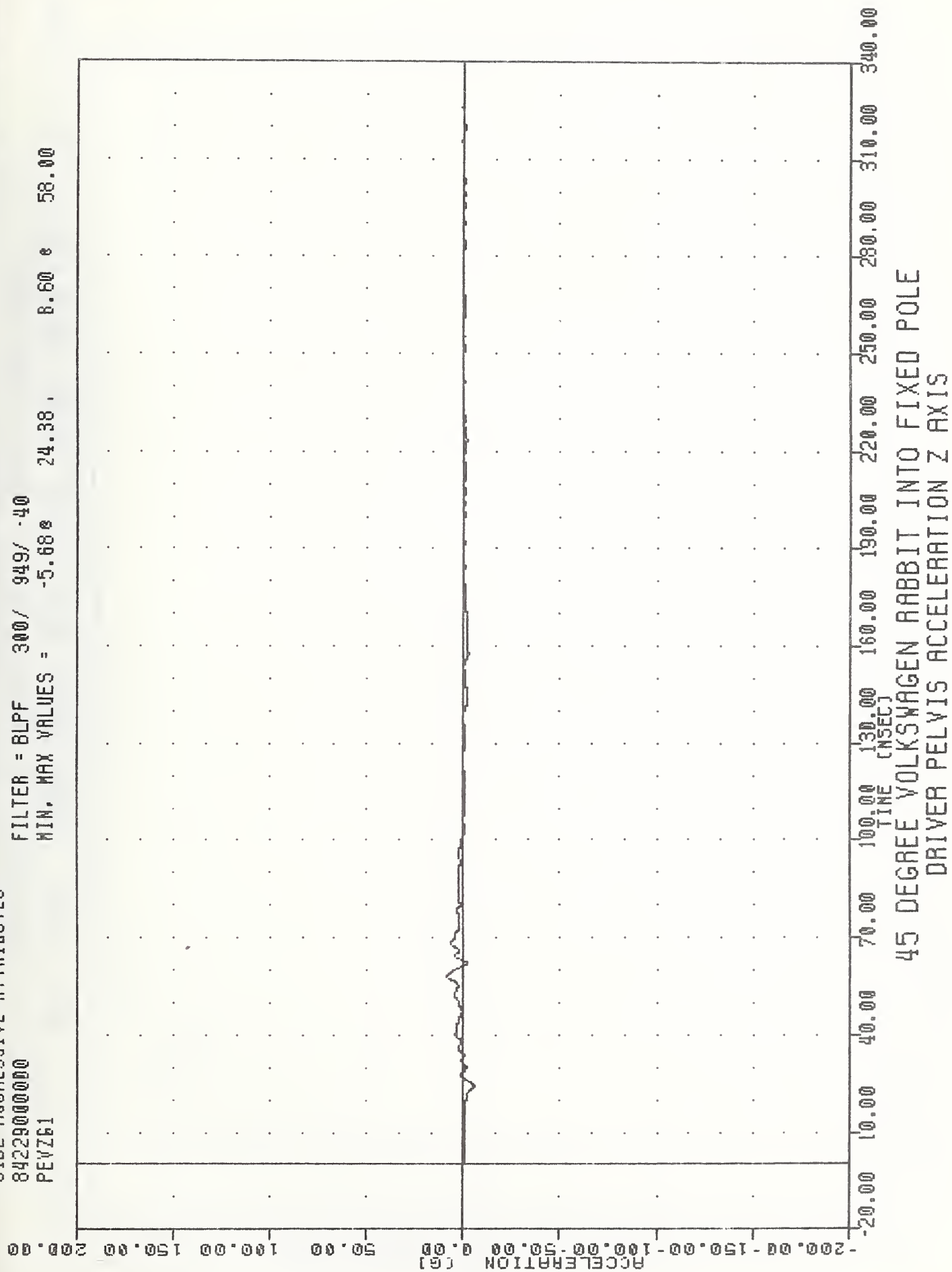
ACCELERATION (G)



-20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER PELVIS ACCELERATION Y AXIS

TML 840810 PLU: 0A1c 24-nub-04 00:23:30
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 PEVZ61
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -5.680 24.38 8.60 58.00



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER PELVIS ACCELERATION Z AXIS

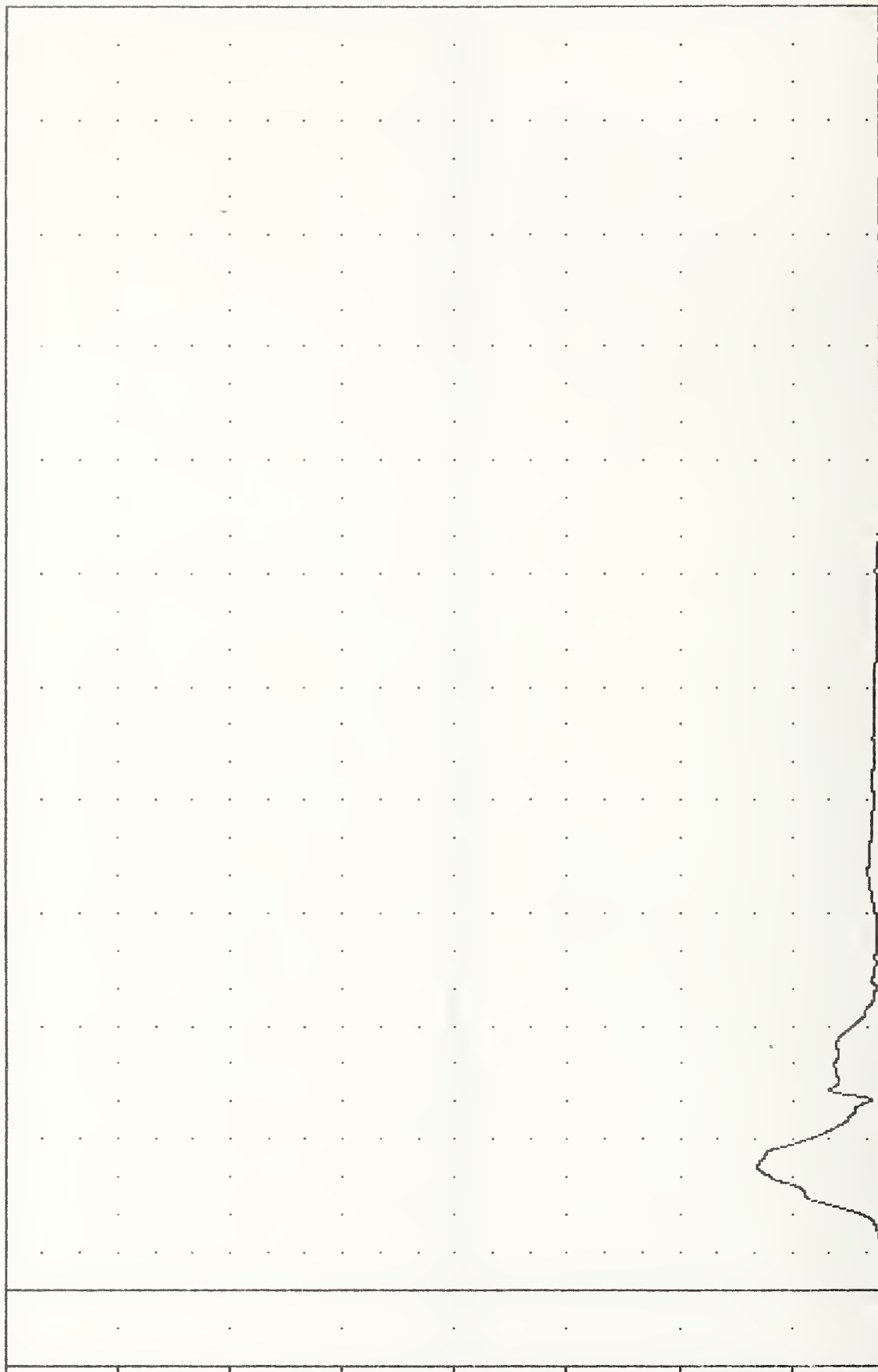
INC 840810
 SIDE AGGRESSIVE ATTRIBUTES
 34229000000
 PEVRG1

PLU1 DATE 24-AUG-84 WD:23:30

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.218 -1.13, 55.38 8 32.75

ACCELERATION [G]



0.00 50.00 100.00 150.00 200.00 250.00 300.00 350.00

45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 DRIVER PELVIS RESULTANT

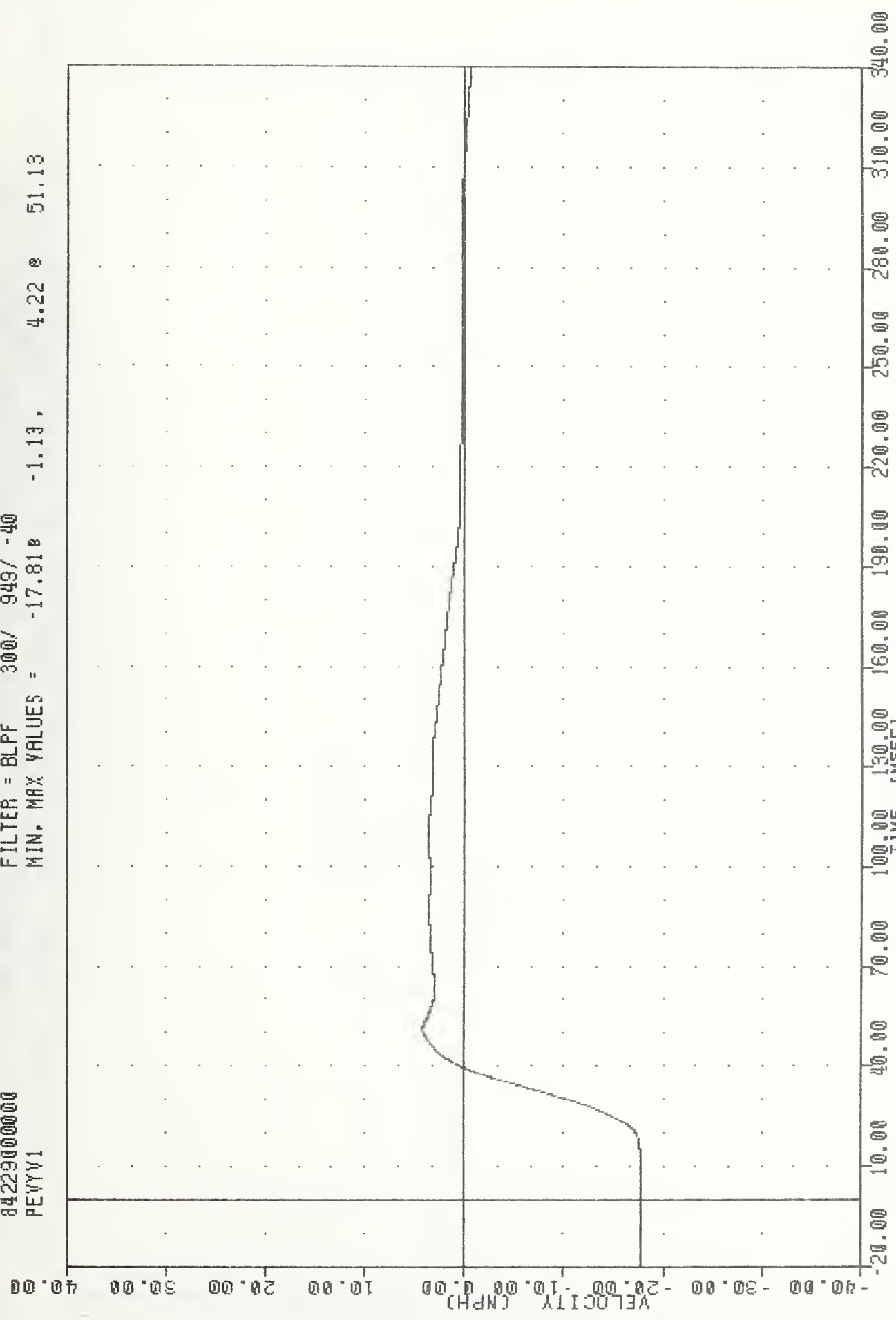
FILE: DATA 23 AUG 82 11:30:00

0408.00
SIDE AGGRESSIVE ATTRIBUTES

84229000000
PEVYV1

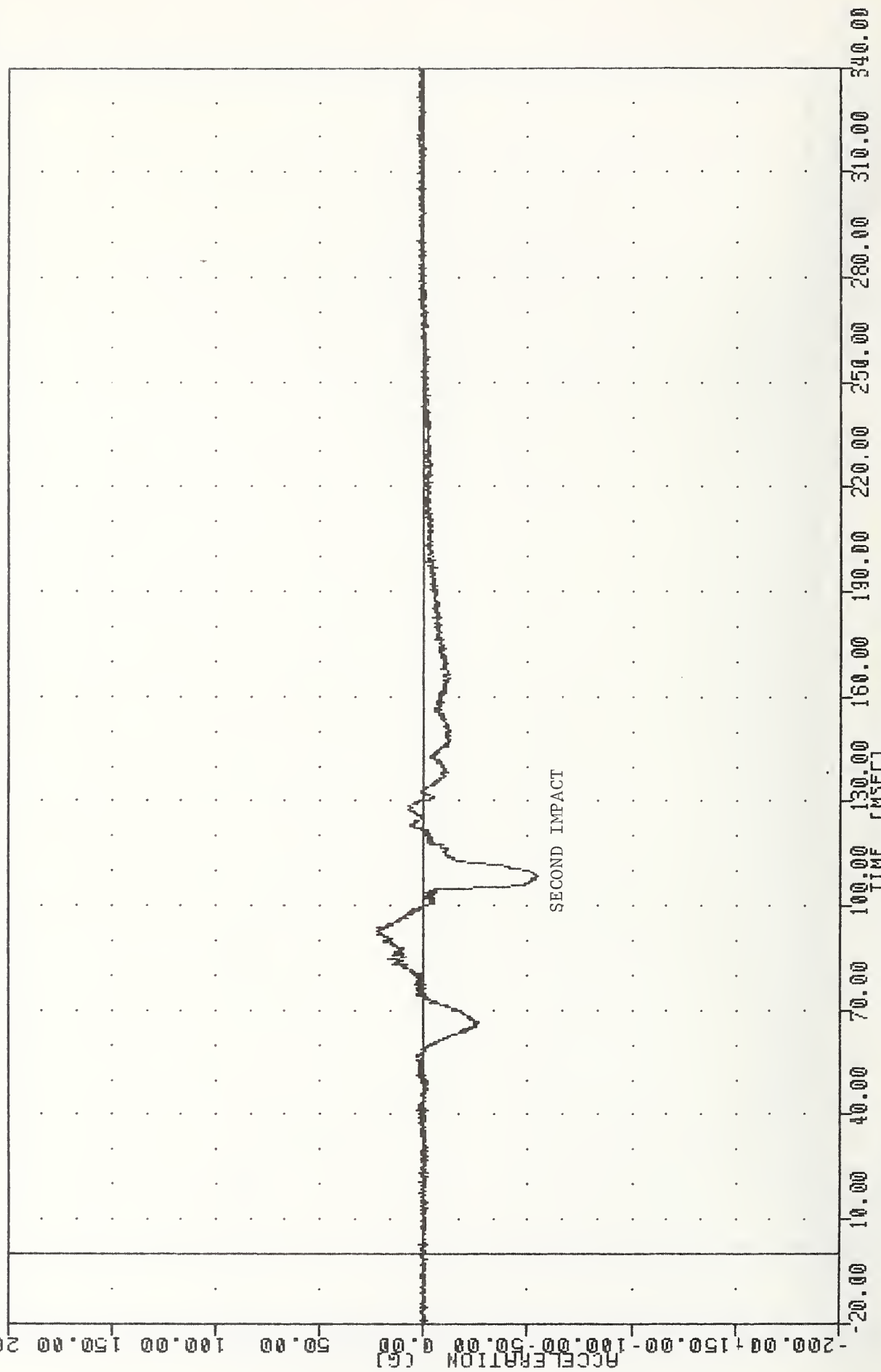
FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -17.818 -1.13 4.22 51.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING PEVYG1

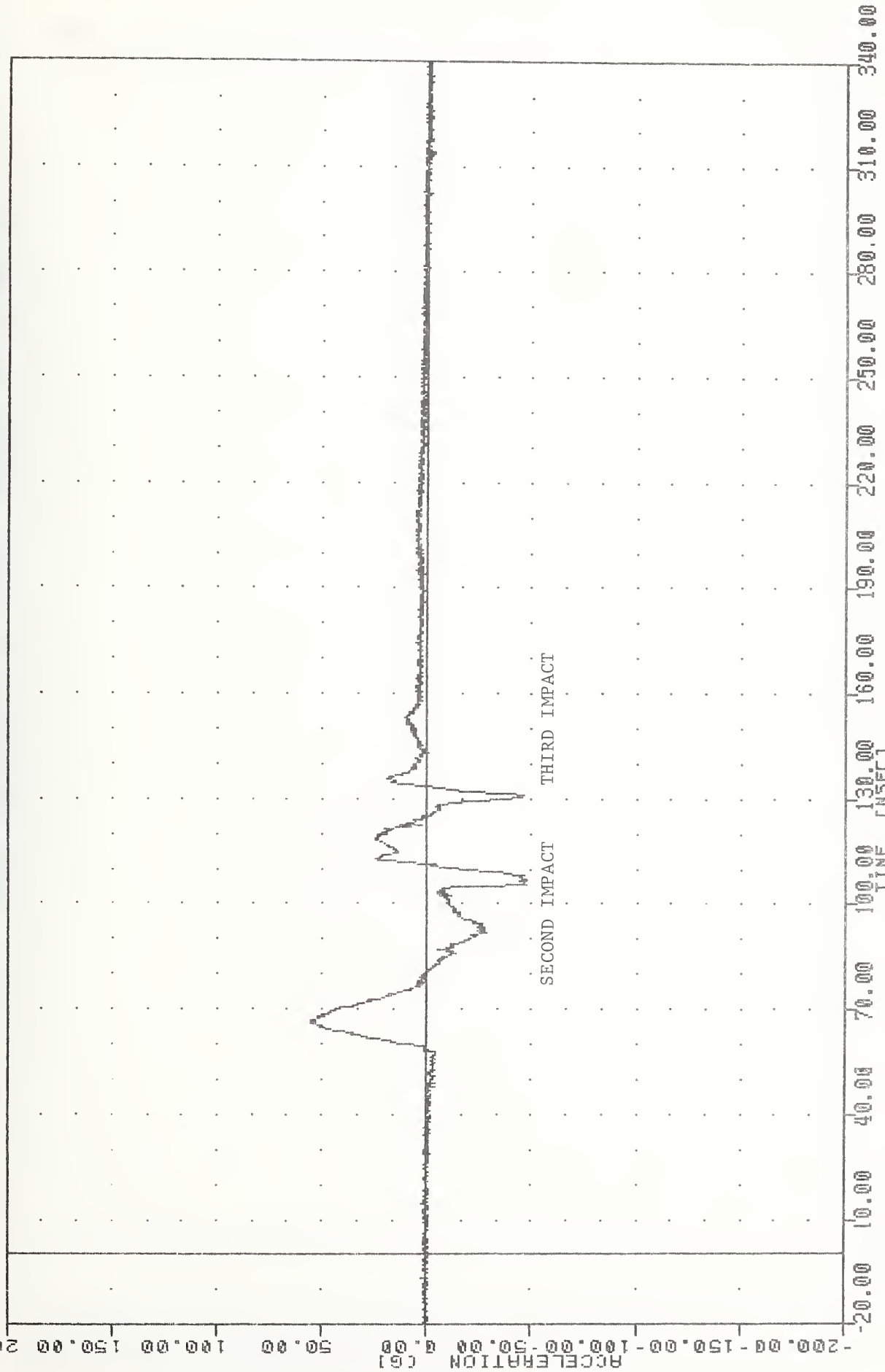
INC 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 HEDXG3
 PLU1 DRIL 24-1UG-04 00.23:00
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -55.070 108.50, 22.31 0 93.50



45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER HEAD ACCELERATION X AXIS

TML 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 HEDY63

PLU: DRAC 24-005-04 00.23:00
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -47.53e 107.13. 55.22 e 65.63



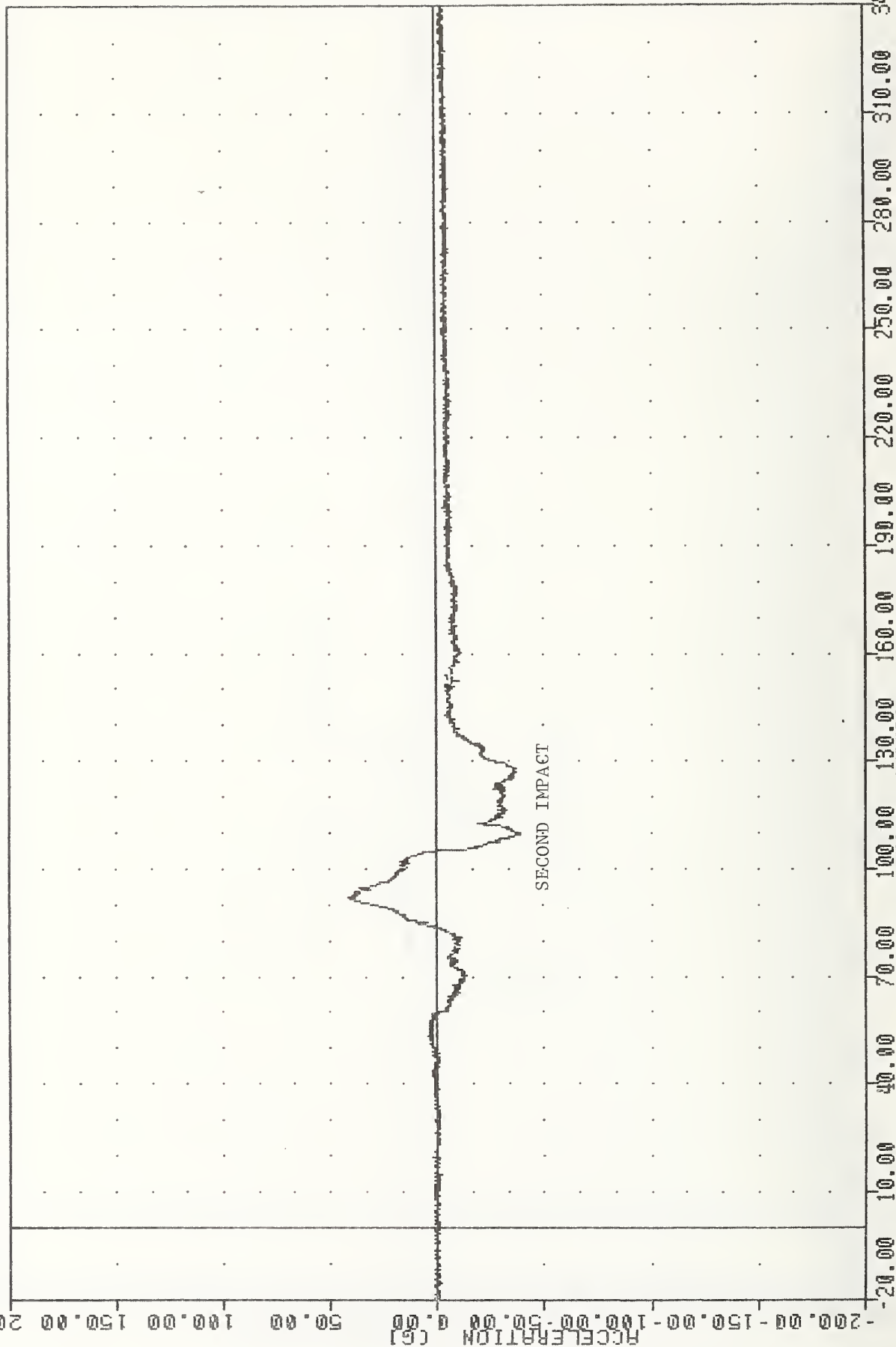
45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER HEAD ACCELERATION Y AXIS

PLU: DA: L 23 AUG 02 00:23:00

INC 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
HEDZG3

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -39.268 109.25 41.37 8 91.63

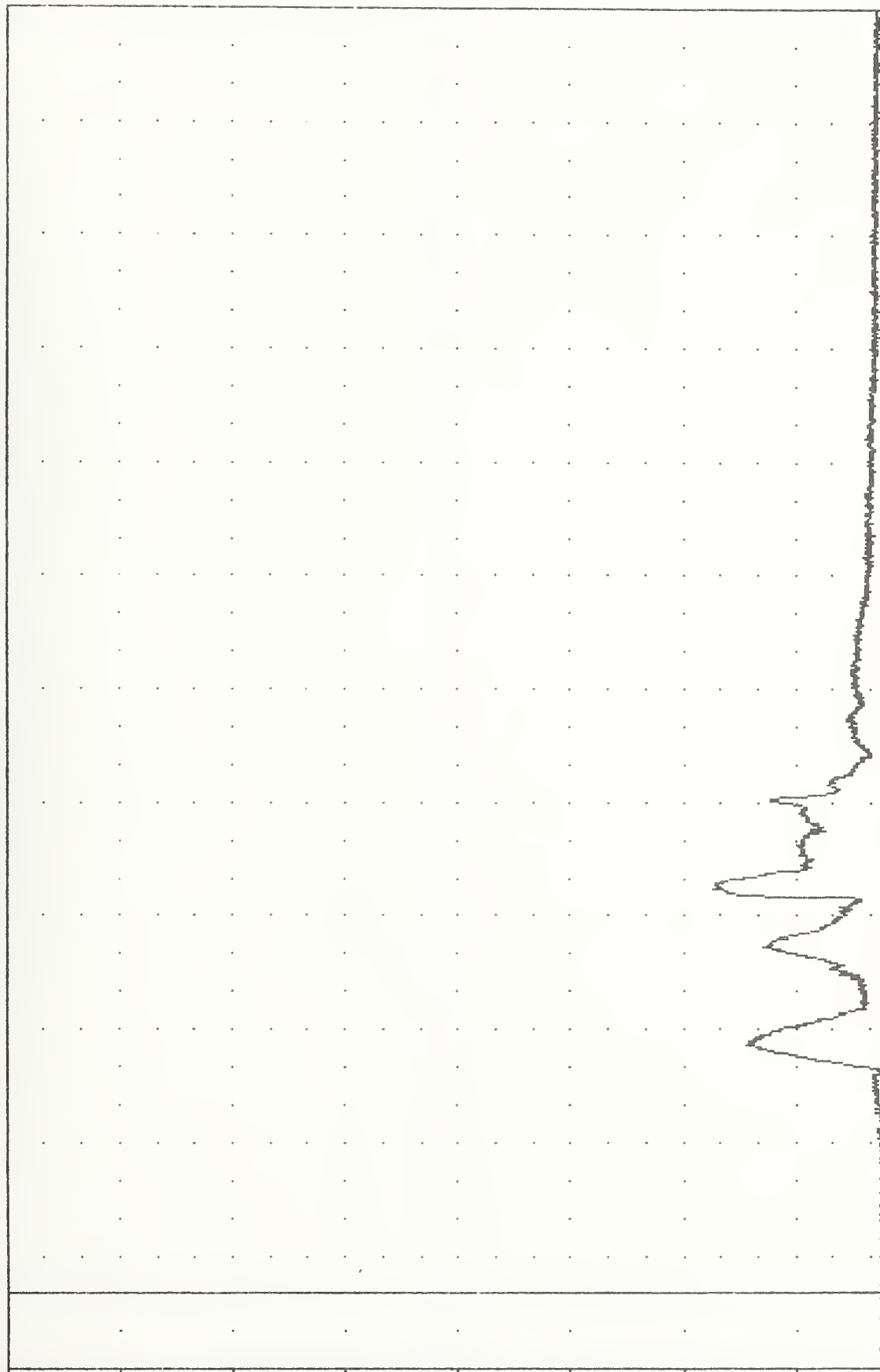


45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER HEAD ACCELERATION Z AXIS

TOL 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 HEAD63

PLAN DAIL 2x 116-0x 00.23100
 FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = 0.060 -9.38, 76.89 107.13

ACCELERATION (G)



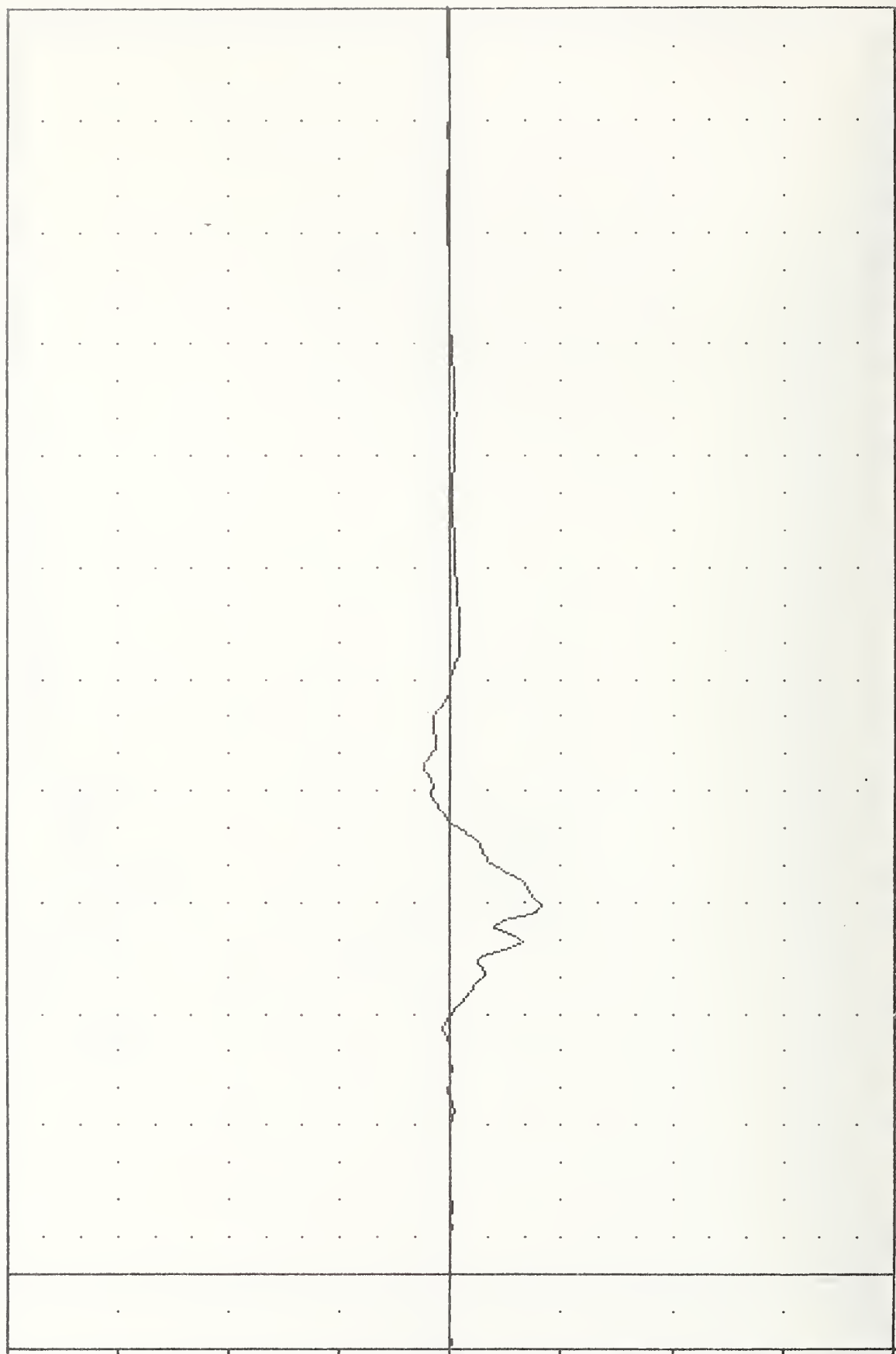
45 DEGREE VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER HEAD RESULTANT

FILE: DATA 47 AUG 87 00:24:20

FILE: 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T01XG3

FILTER = HSRI 136/ 189/ -50
MIN. MAX VALUES = -41.078 98.12 12.00 8 136.25

ACCELERATION (G)



0.00 50.00 100.00 150.00 200.00 -200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSFNGR UPPER SPINE ACCELERATION X AXIS

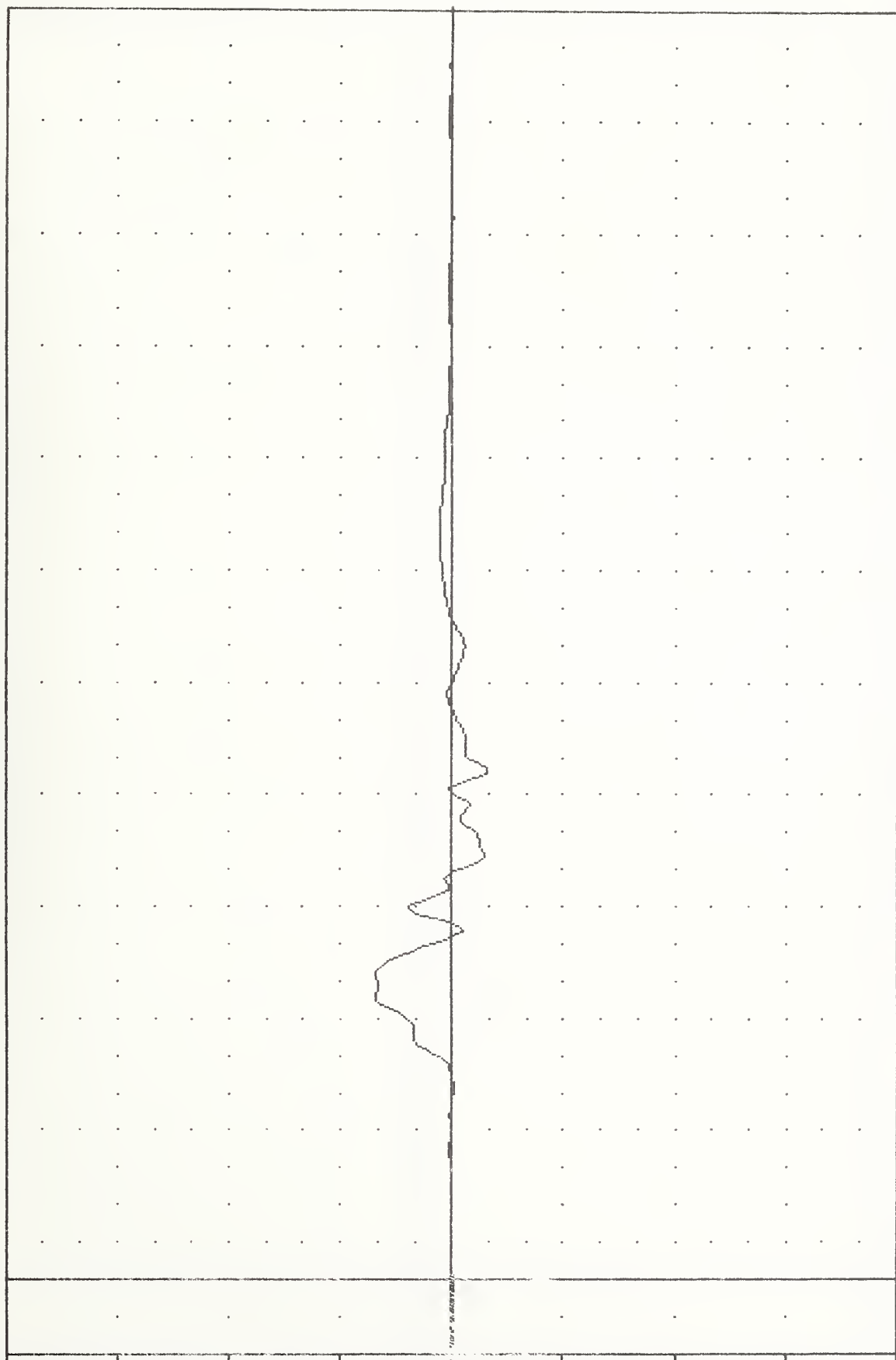
INL 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T01Y63

FLUOR DRIE 24-AUG-04 00.24:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -15.92e 135.62, 34.36 e 75.00

ACCELERATION (G)



B-41

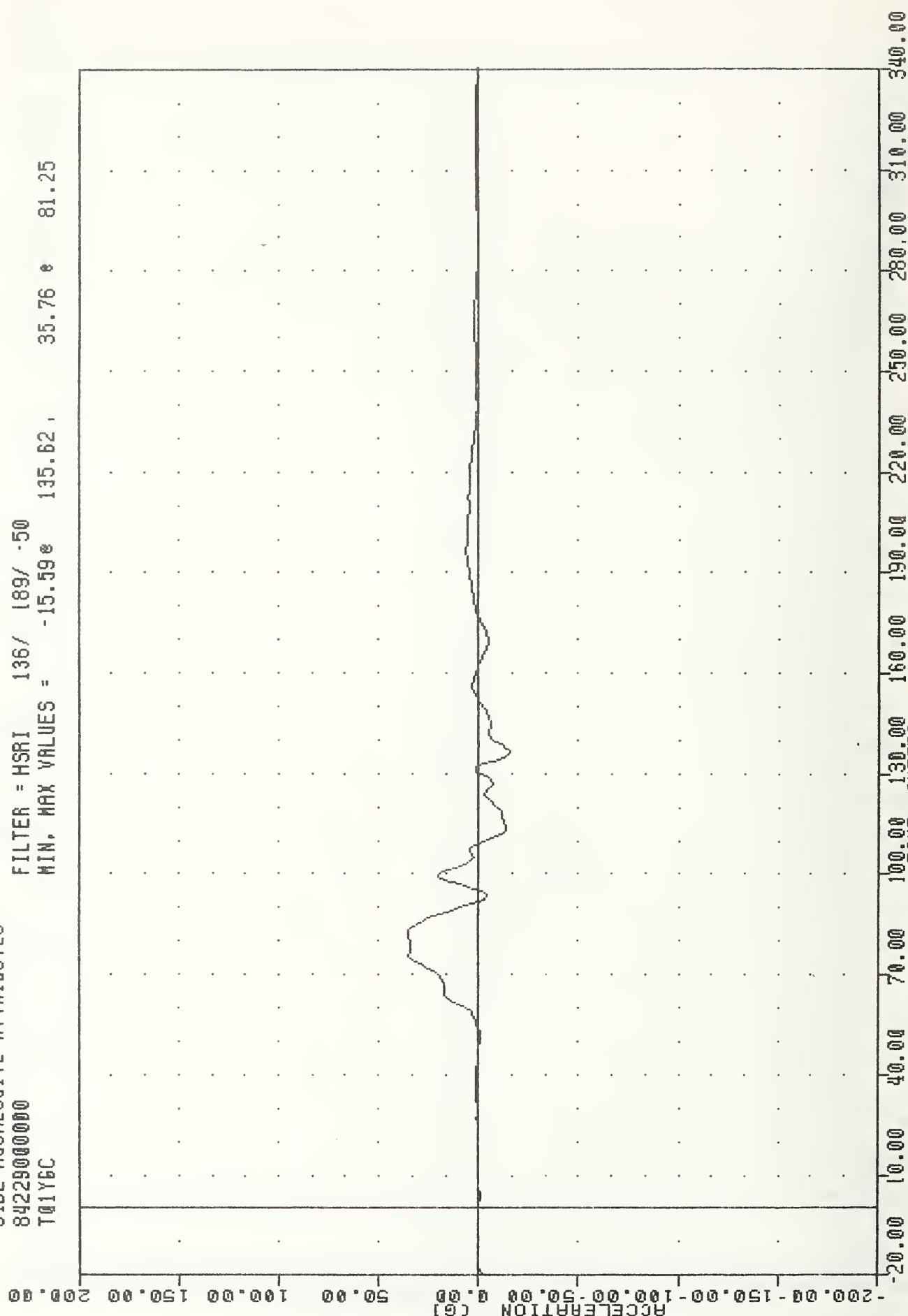
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER UPPER SPINE ACCELERATION Y AXIS

TIME 08:00
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T01Y6C

PLU1 DR1L 23 1105-03 00-24:20

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -15.59 135.62 35.76 81.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER UPPER SPINE ACCELERATION -2 Y AXIS

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T01ZG3

PLUT DATE 24-HUG-84 08:24:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -15.420 98.75, 11.54 e 67.50

200.00

150.00

100.00

50.00

0.00

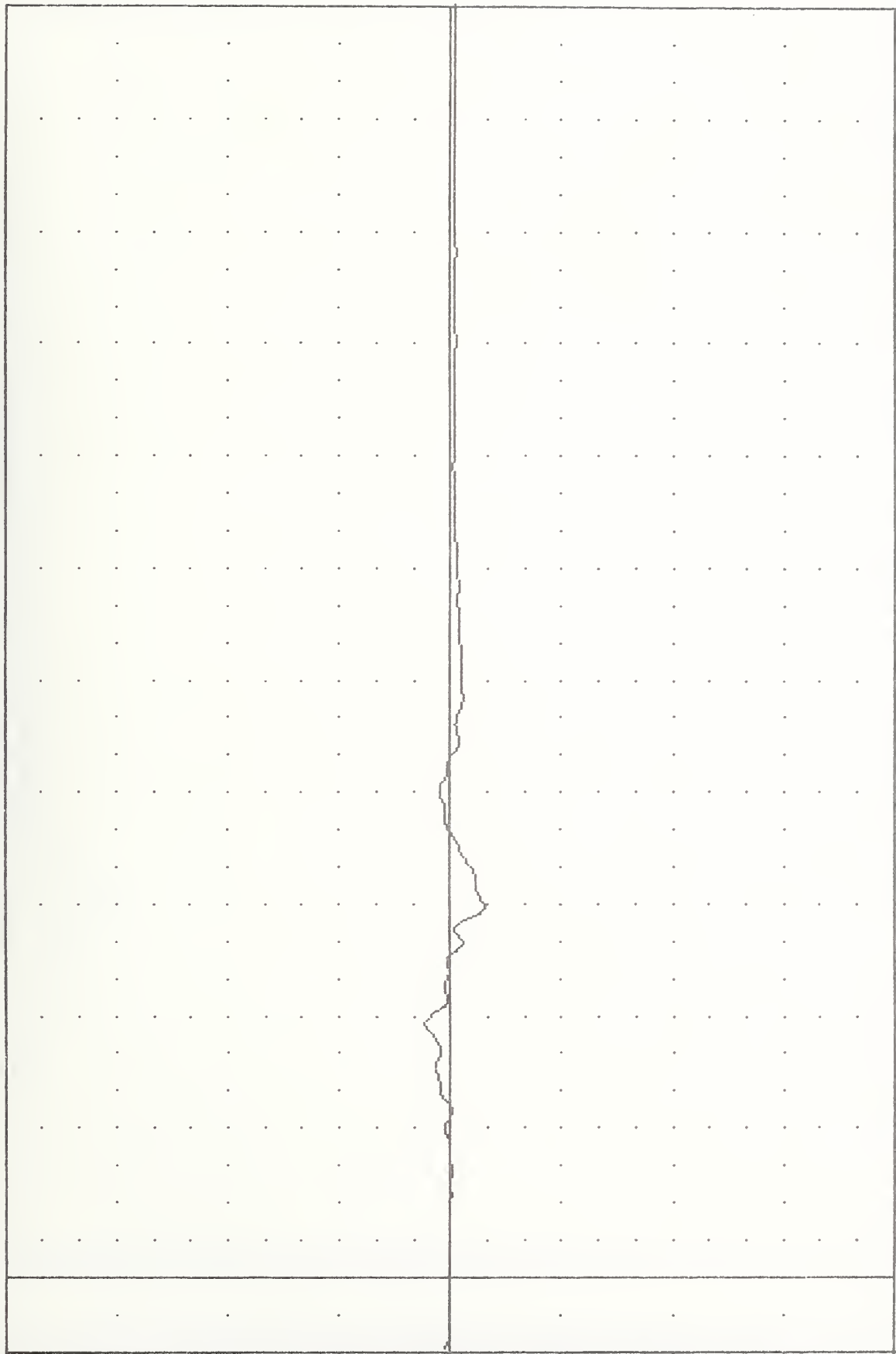
-50.00

-100.00

-150.00

-200.00

B-43



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER UPPER SPINE ACCELERATION Z AXIS

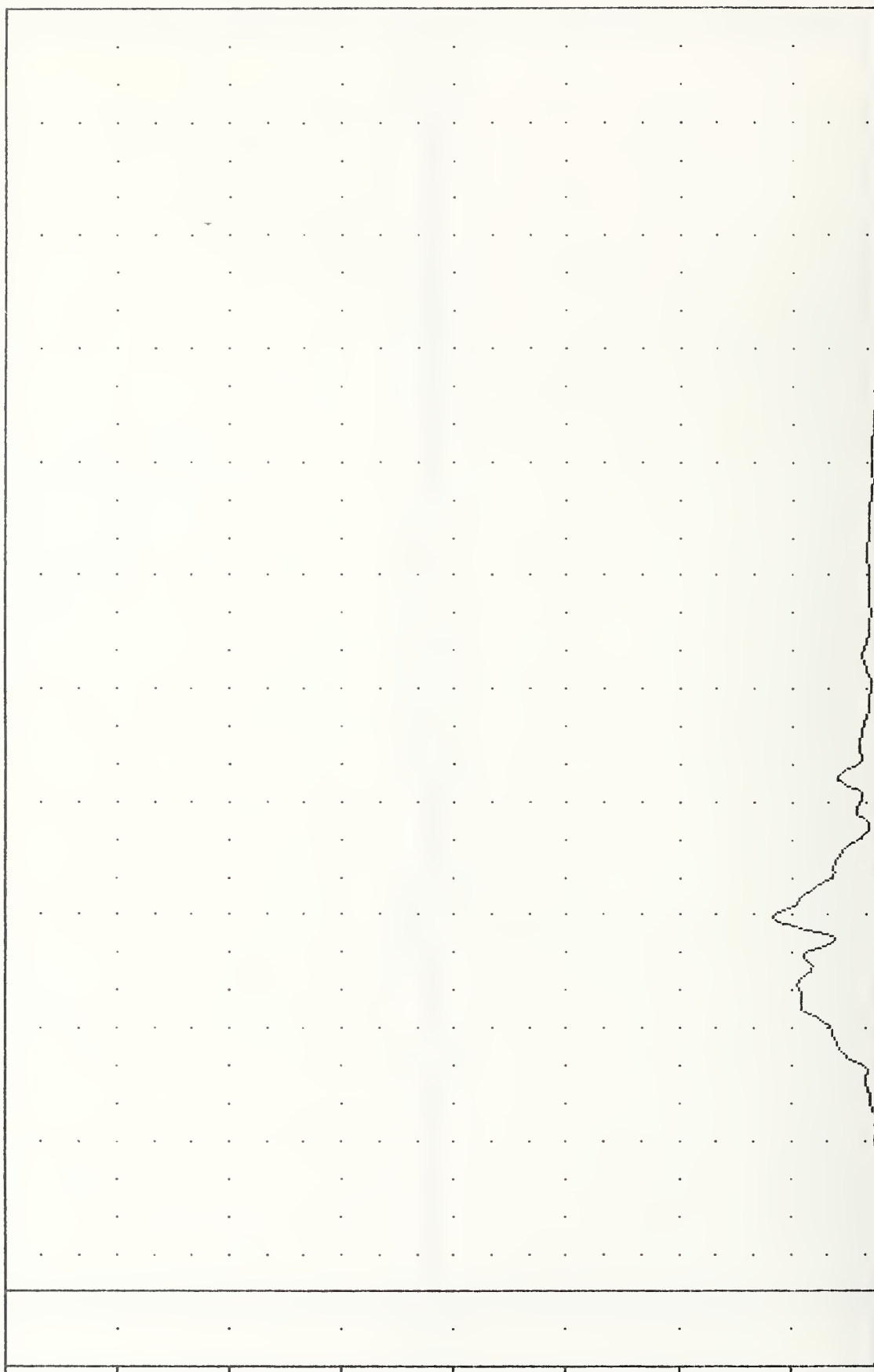
TAC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T01R63

PLU1 DATE 24-HUG-84 08:24:26

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.090 5.00 47.86 0 98.75

ACCELERATION (G)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER UPPER SPINE RESULTANT

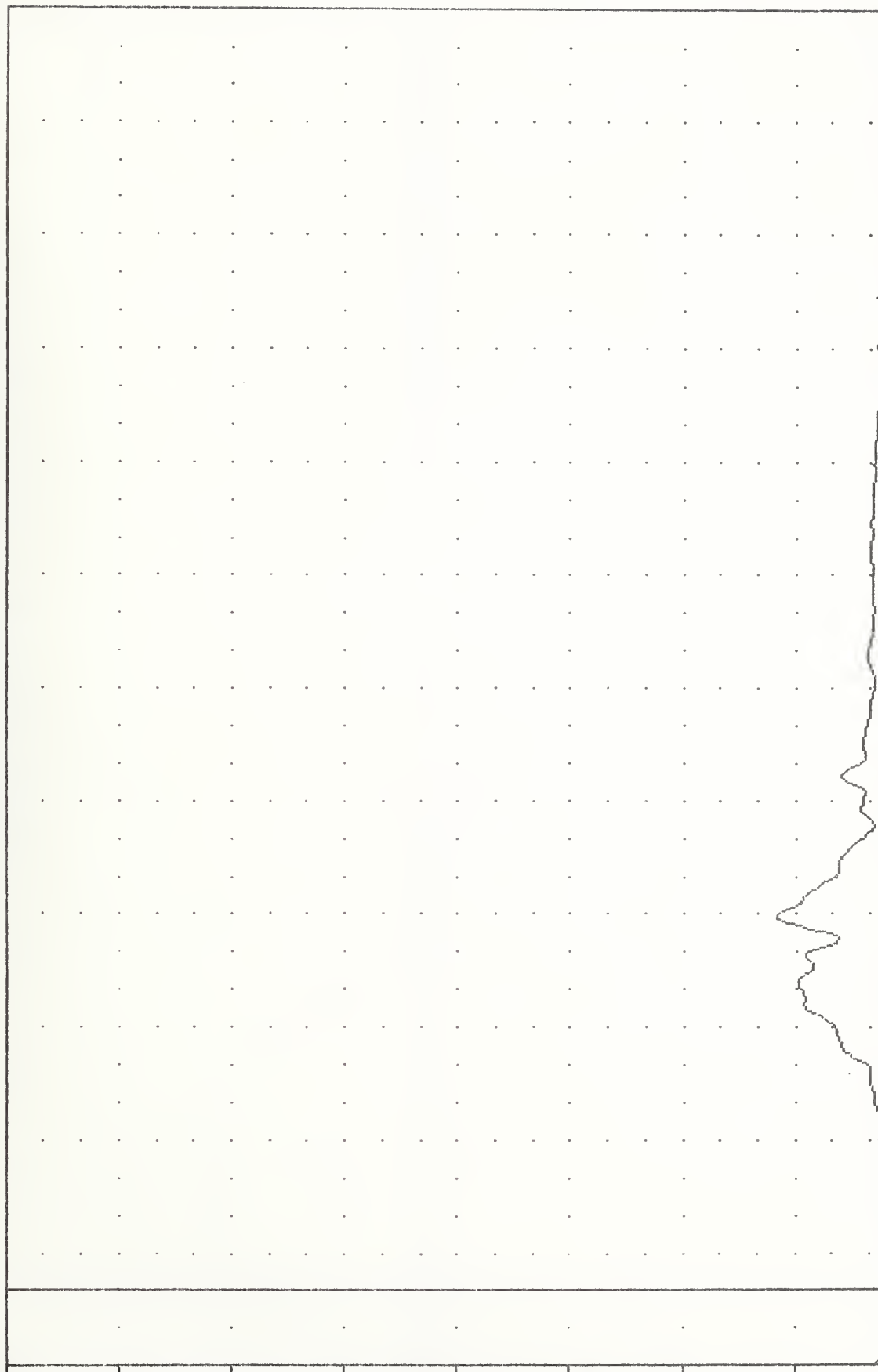
TAC , 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T01REC

PLU1 DATE 24-MUG-84 W8:25:38

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.100 0.00 48.07 98.75

ACCELERATION (G)



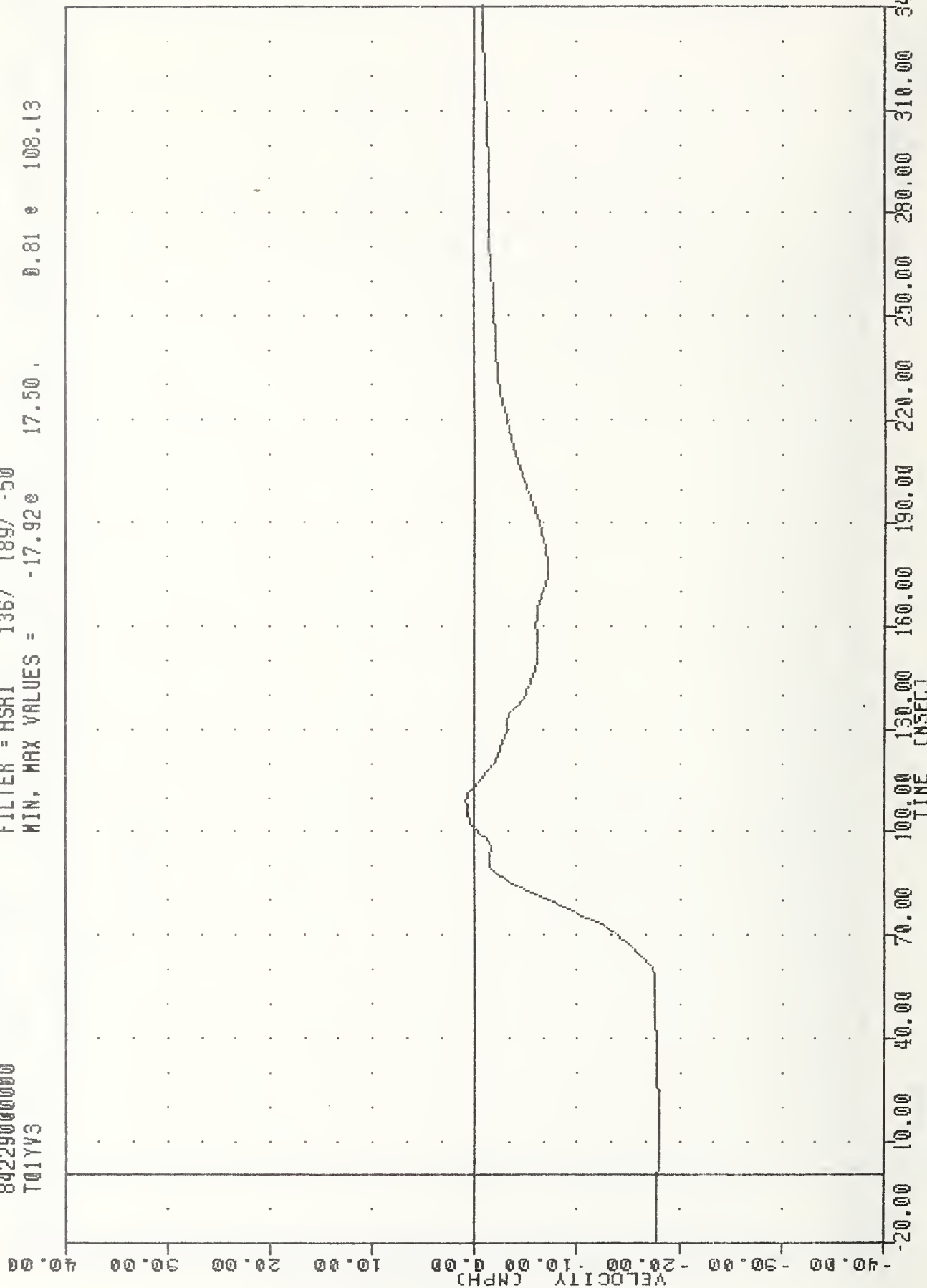
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER UPPER SPINE RESULTANT USING T01YGC

TIME 040810
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 T01YV3

PLU: DRIL 23 1106-03 11.29140

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -17.920 17.50 0.81 108.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING T01YV3

208

INSIDE AGGRESSIVE ATTRIBUTES

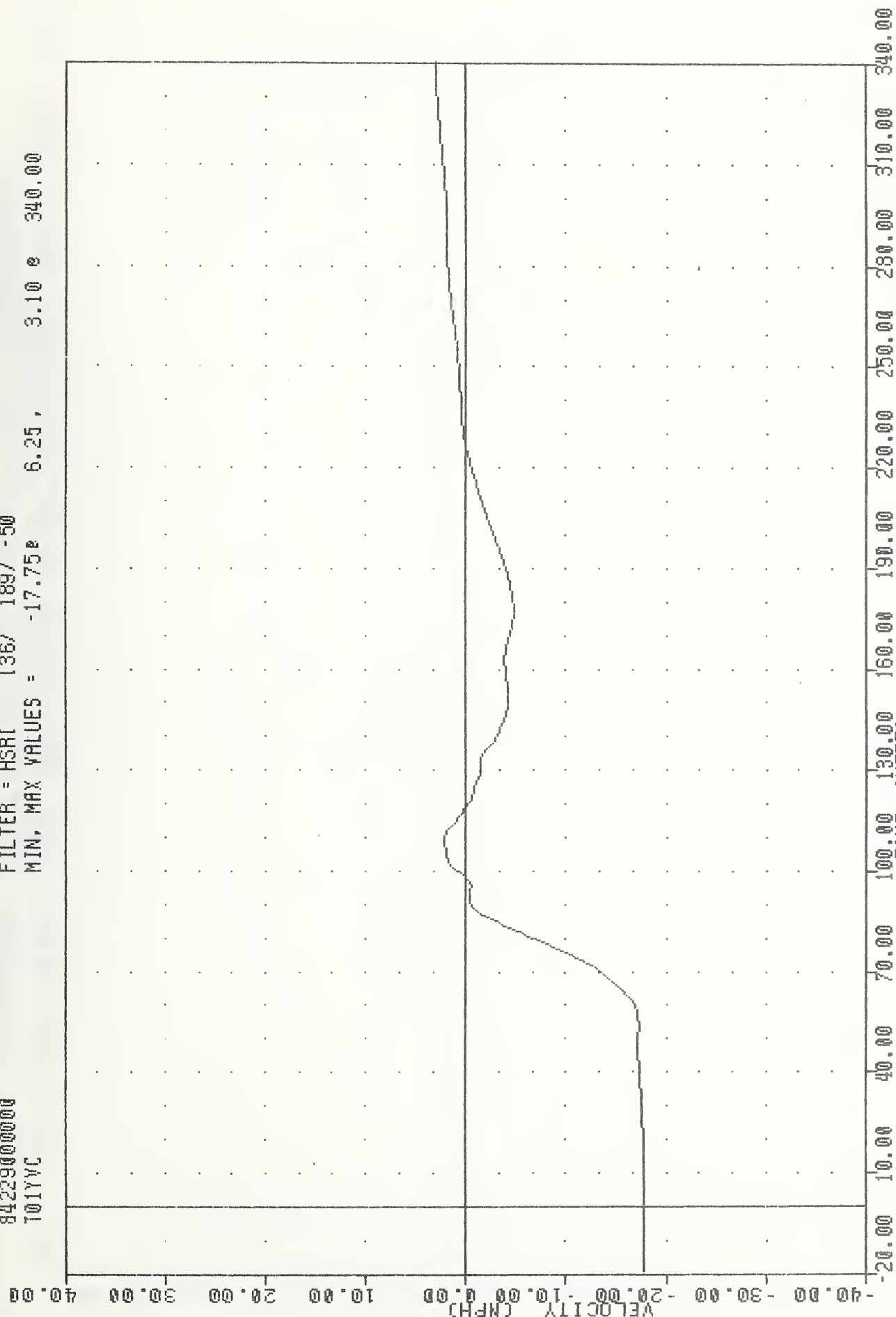
0000062755

34101

FILTER = HSP1 136/ 189/ -50

MIN. MAX VALUES = -17.75%

6.25,	3.10	340.00
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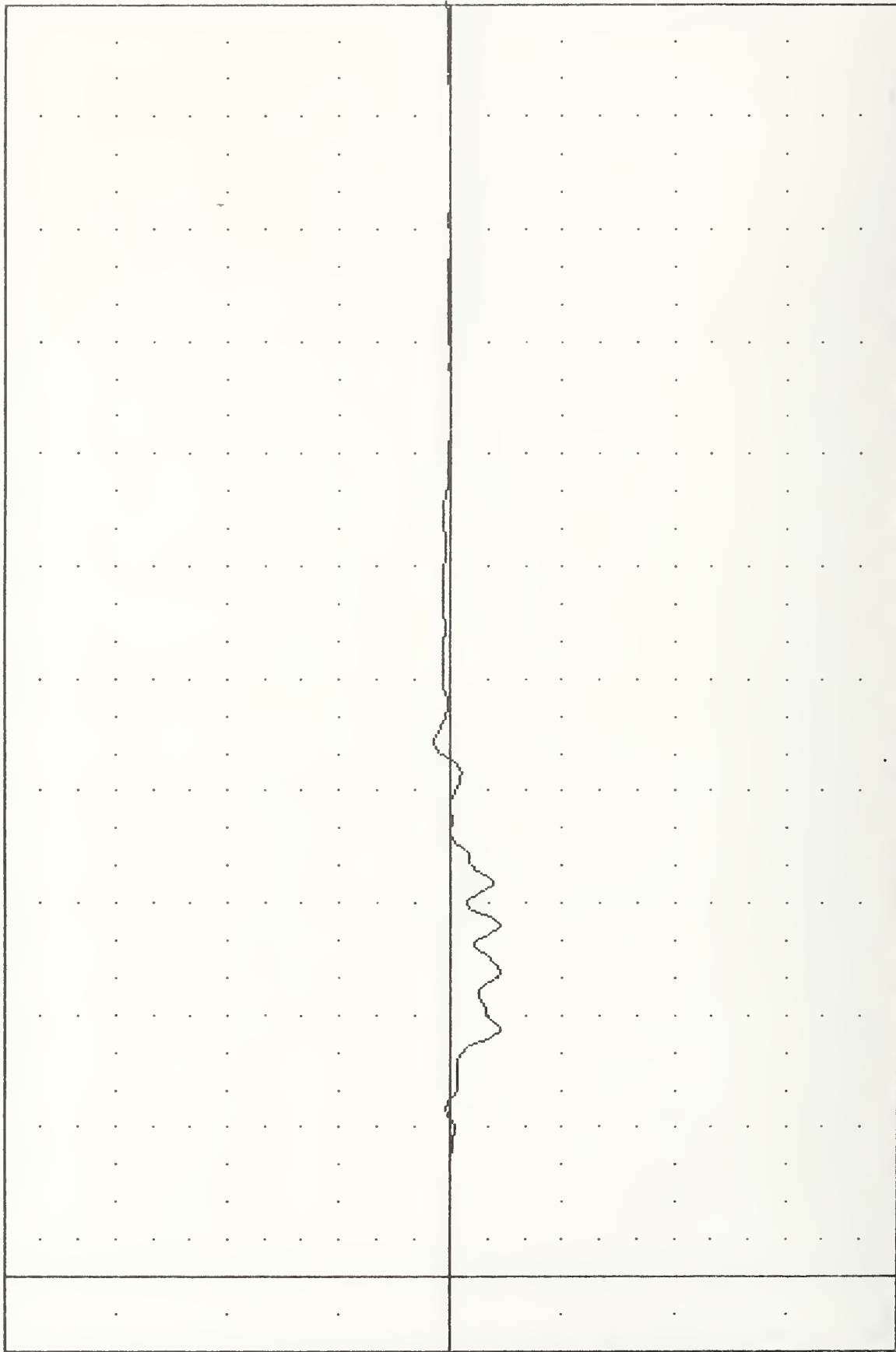
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING T01YGC

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12XG3

PLUI DR1E 24-HUG-84 08:24:26
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -22.16e 65.63, 7.50 e 142.50

ACCELERATION (G)



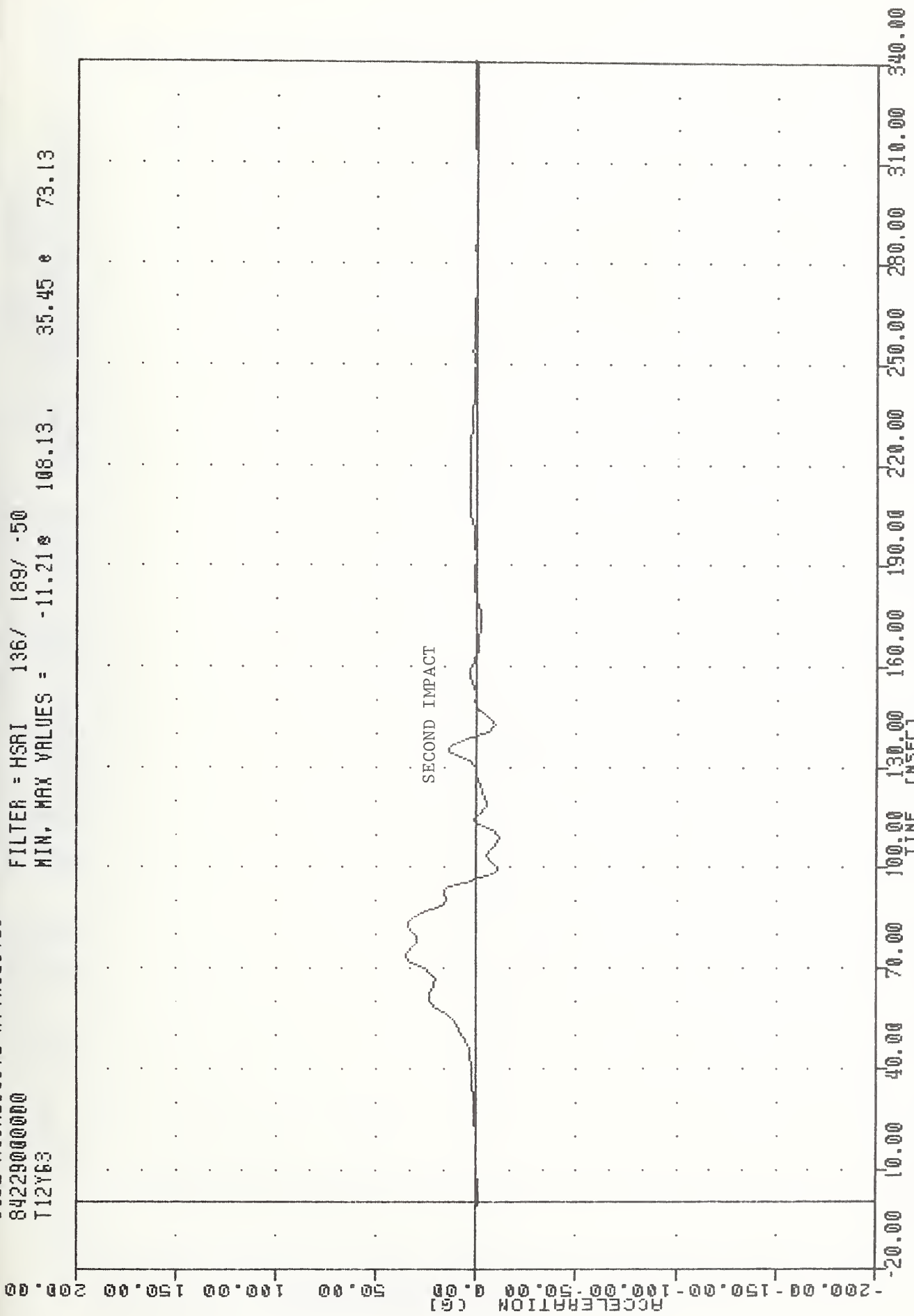
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LOWER SPINE ACCELERATION X AXIS

TMC , 84081b
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T12Y63

PLUI DATE 24-HUG-84 08:24:26

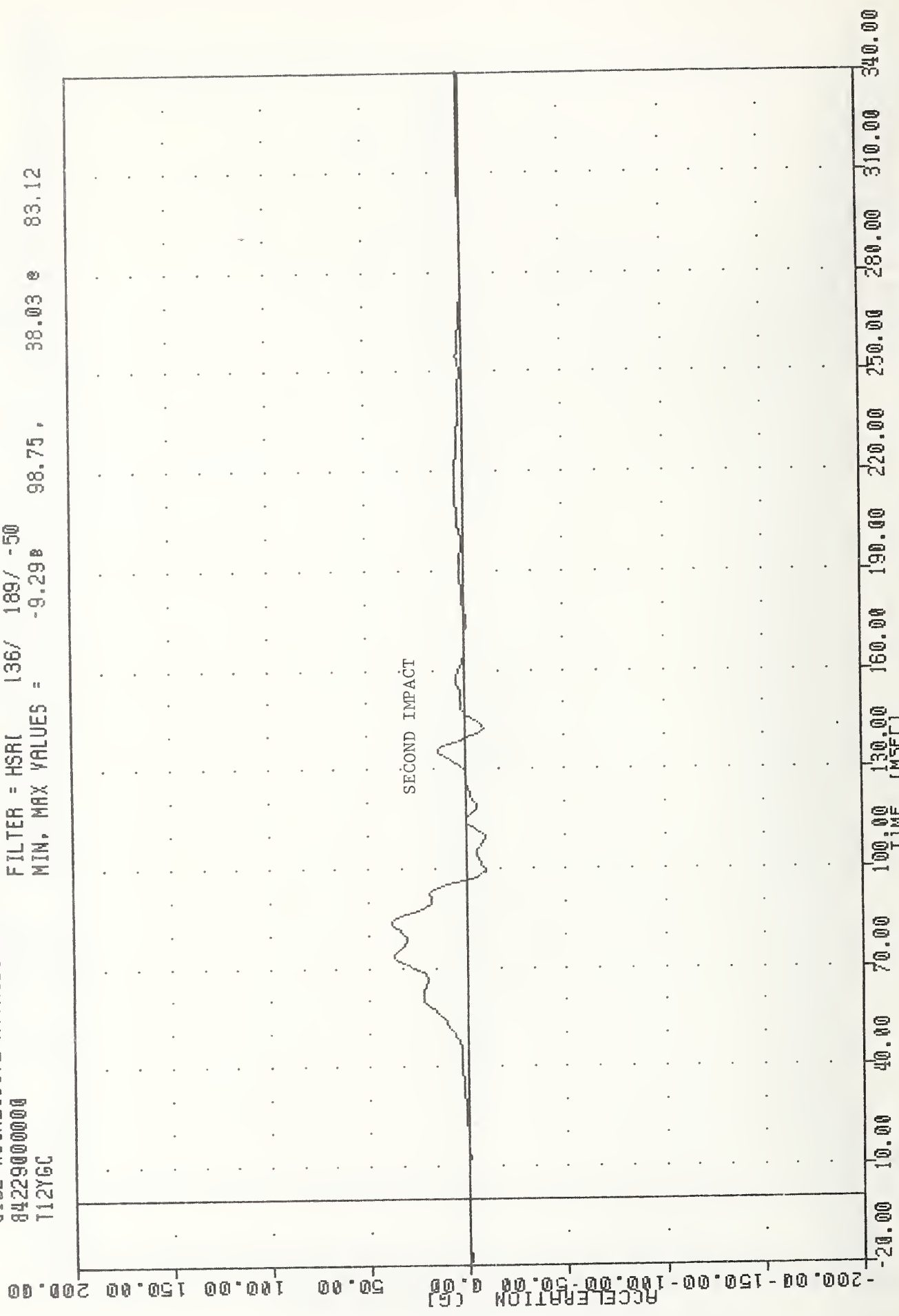
FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -11.21s 108.13, 35.45 s 73.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LOWER SPINE ACCELERATION Y AXIS

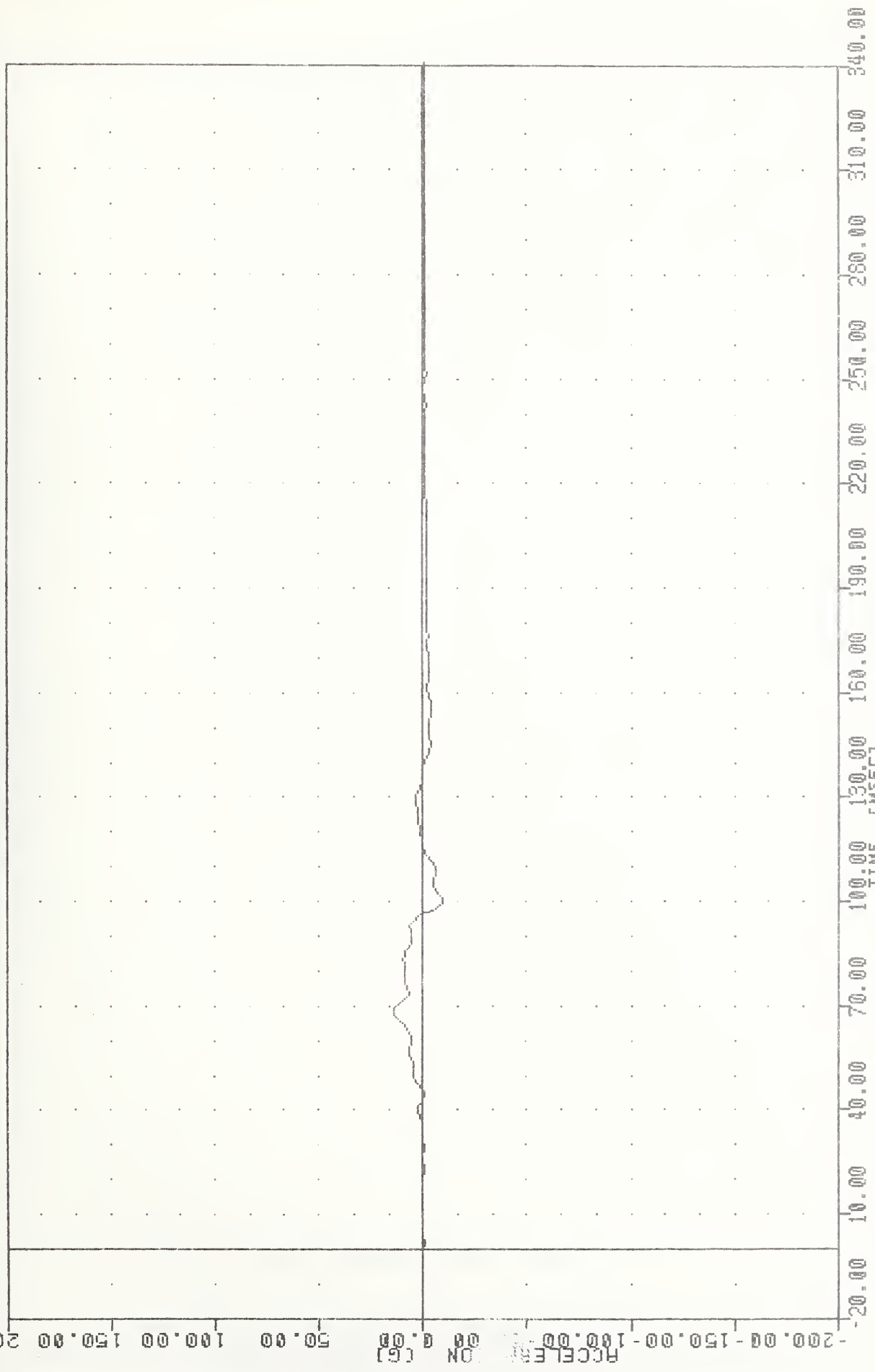
JMC, 84081b
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12YGC

PLU1 DATE 24-HUG-84 W8:24:2b
 FILTER = HSR(136/ 189/ -50
 MIN, MAX VALUES = -9.298 98.75, 38.03 83.12



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LOWER SPINE ACCELERATION #2 Y AXIS

INC , 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12763
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -9.41% 99.37 , 14.55 % 68.13
 FLU1 DRIC 24-HUG-04 00:24:25

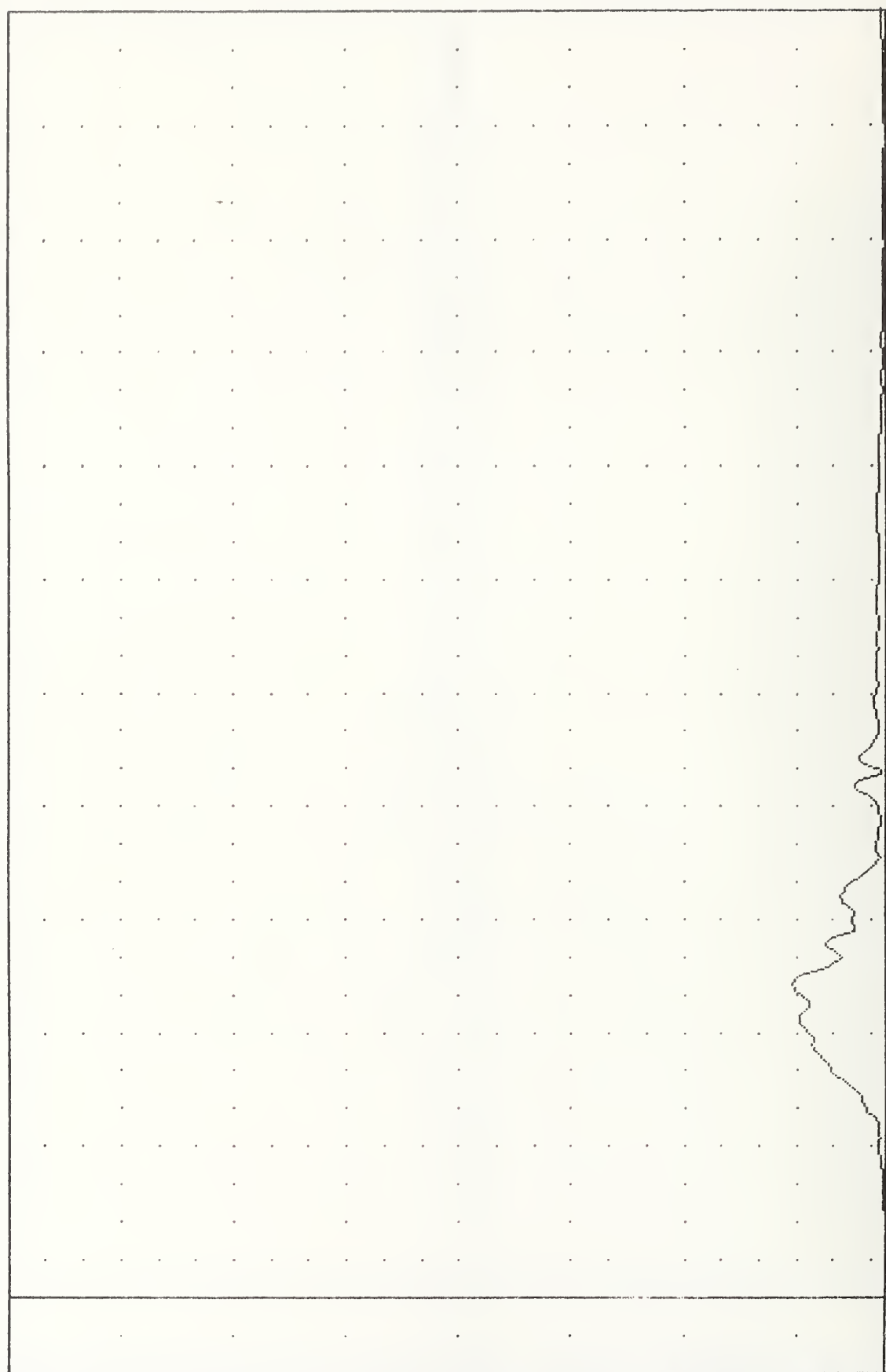


45 DEGREE CRABBED VOLKSWAGEN RABBIT IN
 PASSENGER LOWER SPINE ACCELERATI

INC , 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12RG3

PLU1 DAIC 24-HUG-04 WO.24:20
 FILTER = HSR1 136/ 189/ -50
 MIN, MAX VALUES = 0.128 14.37, 41.38 81.88

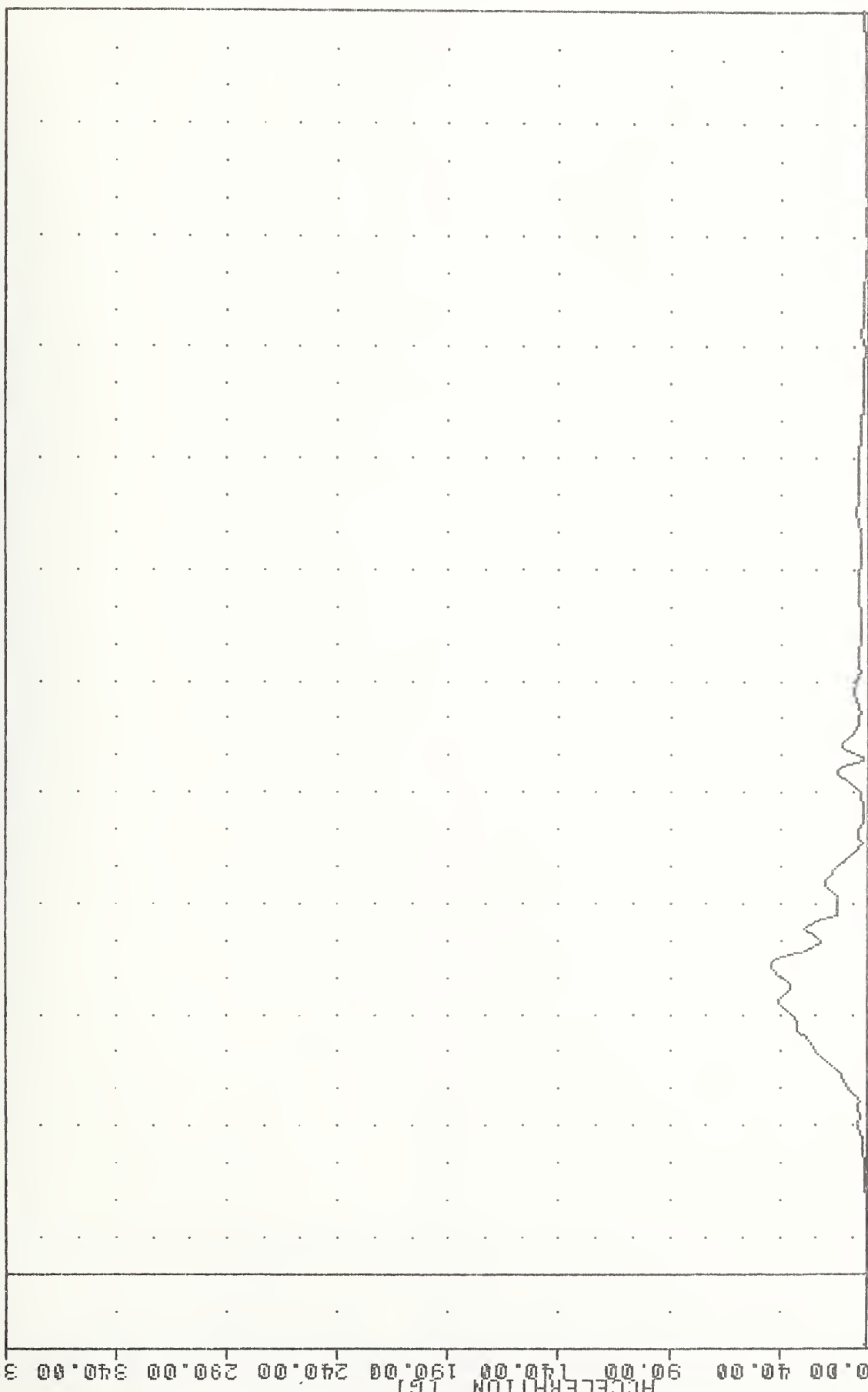
ACCELERATION (G)
 -10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00 350.00 360.00 370.00 380.00 390.00



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LOWER SPINE RESULTANT

1mL , 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12RGC

PLU: DRIC 24-HUG-04 WO: 25:00
 FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = 0.098 14.37, 44.20 8 82.50



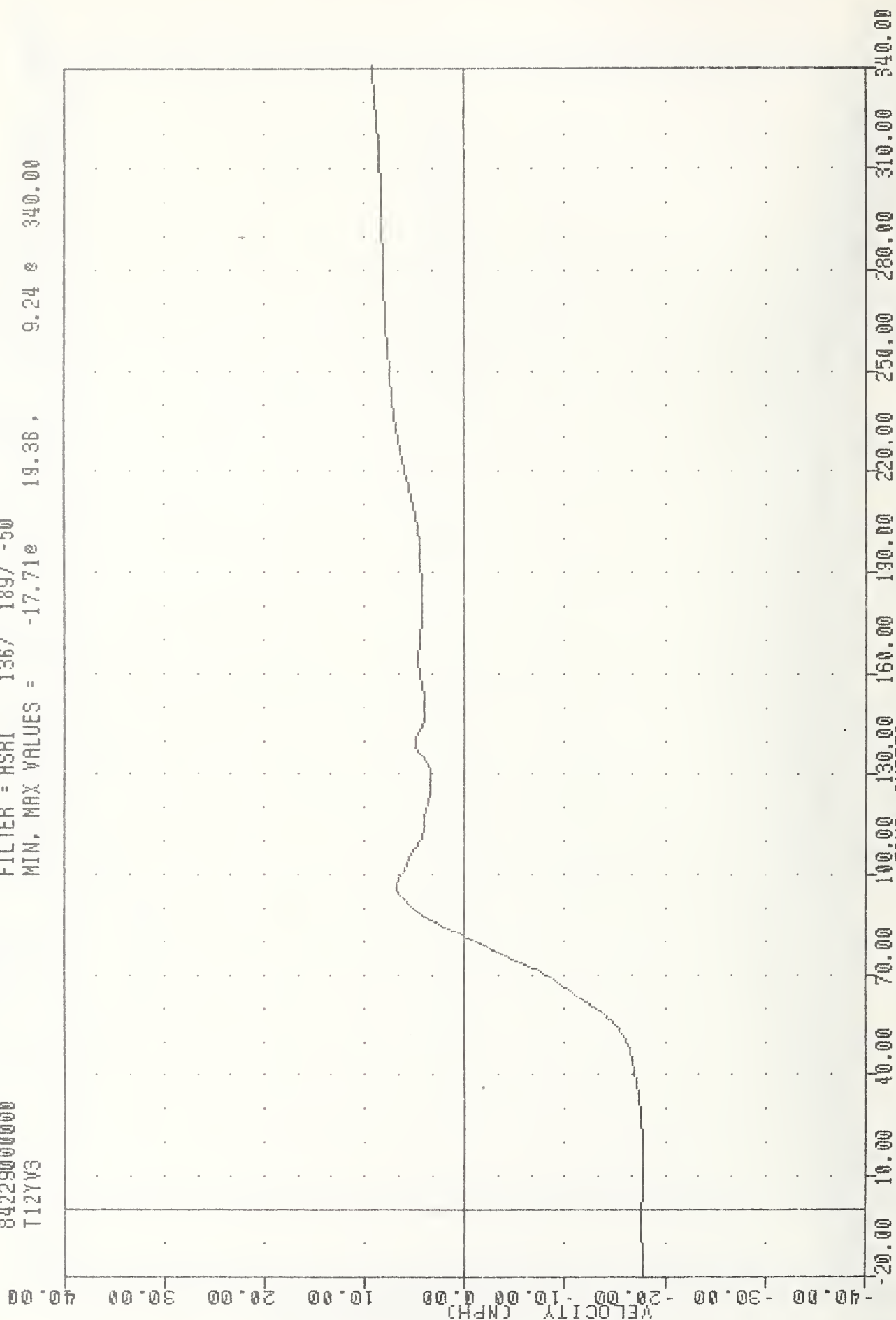
-10.00 40.00 90.00 140.00 190.00 240.00 290.00 340.00
 -20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LOWER SPINE RESULTANT USING T12YGC

THU 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 T12YV3

PLU1 DATE 24-HUG-84 11:29:48

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.71e 19.36, 9.24 e 340.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING T12Y63

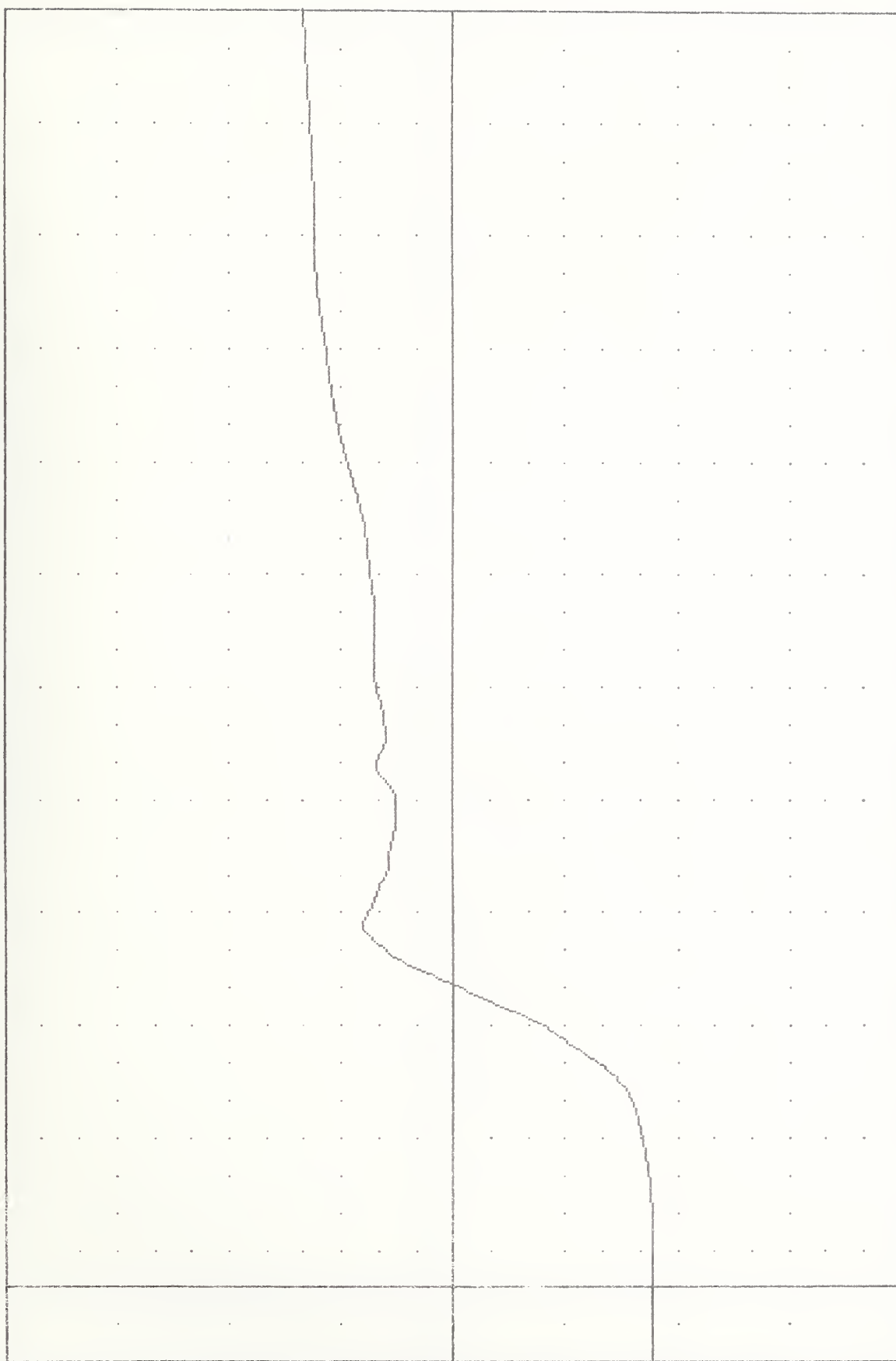
TAL 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
T12YVC

PLU1 DATE 24-MAY-84 11:29:48

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.76e -7.50 13.43 e 340.00

VELOCITY (MPH)



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING T12YVC

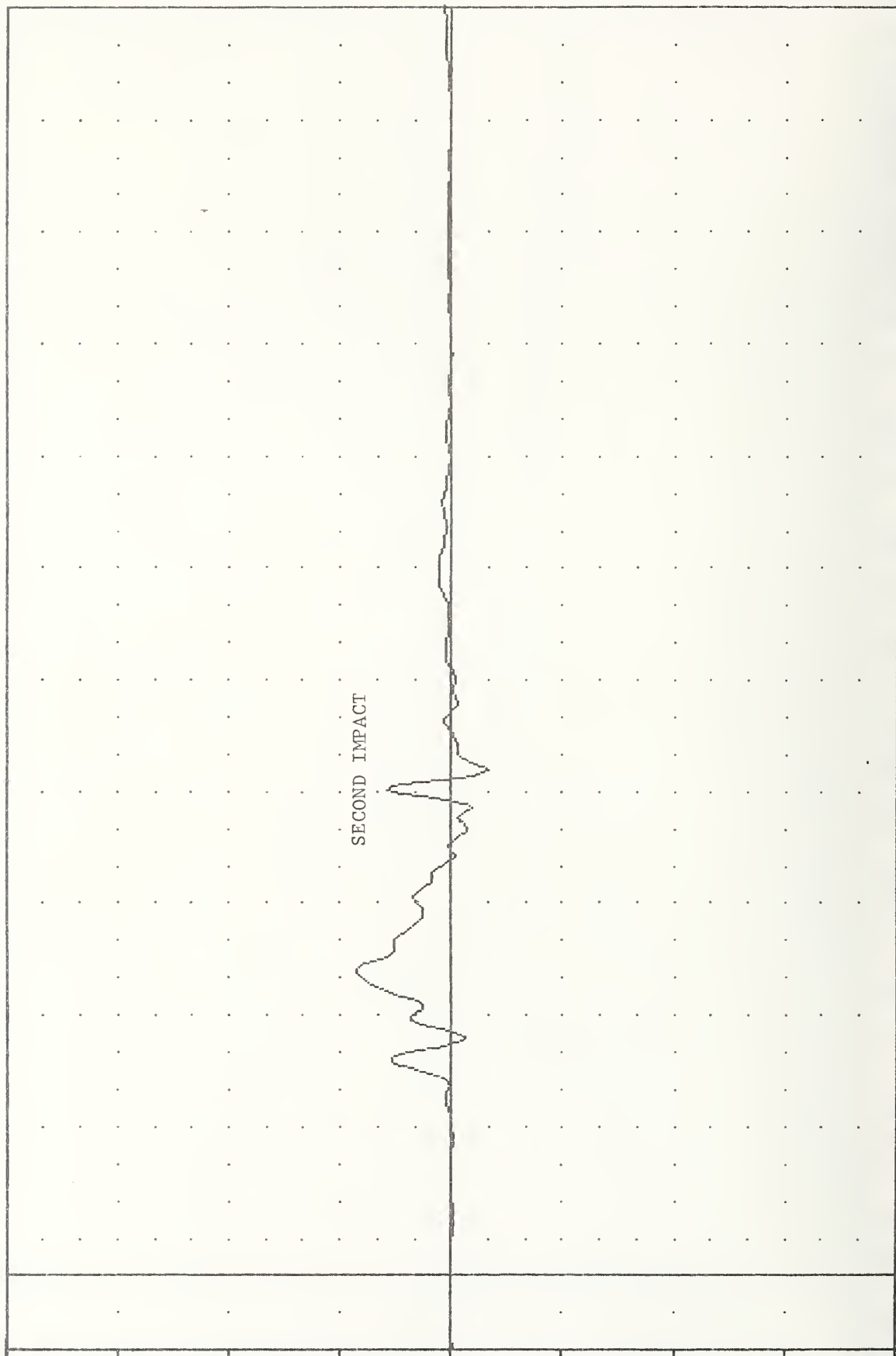
TIM 040810
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 LURY63

PLU1 DATE 24-n06-04 00.24:20

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -16.460 135.00, 42.83 81.25

ACCELERATION (G)



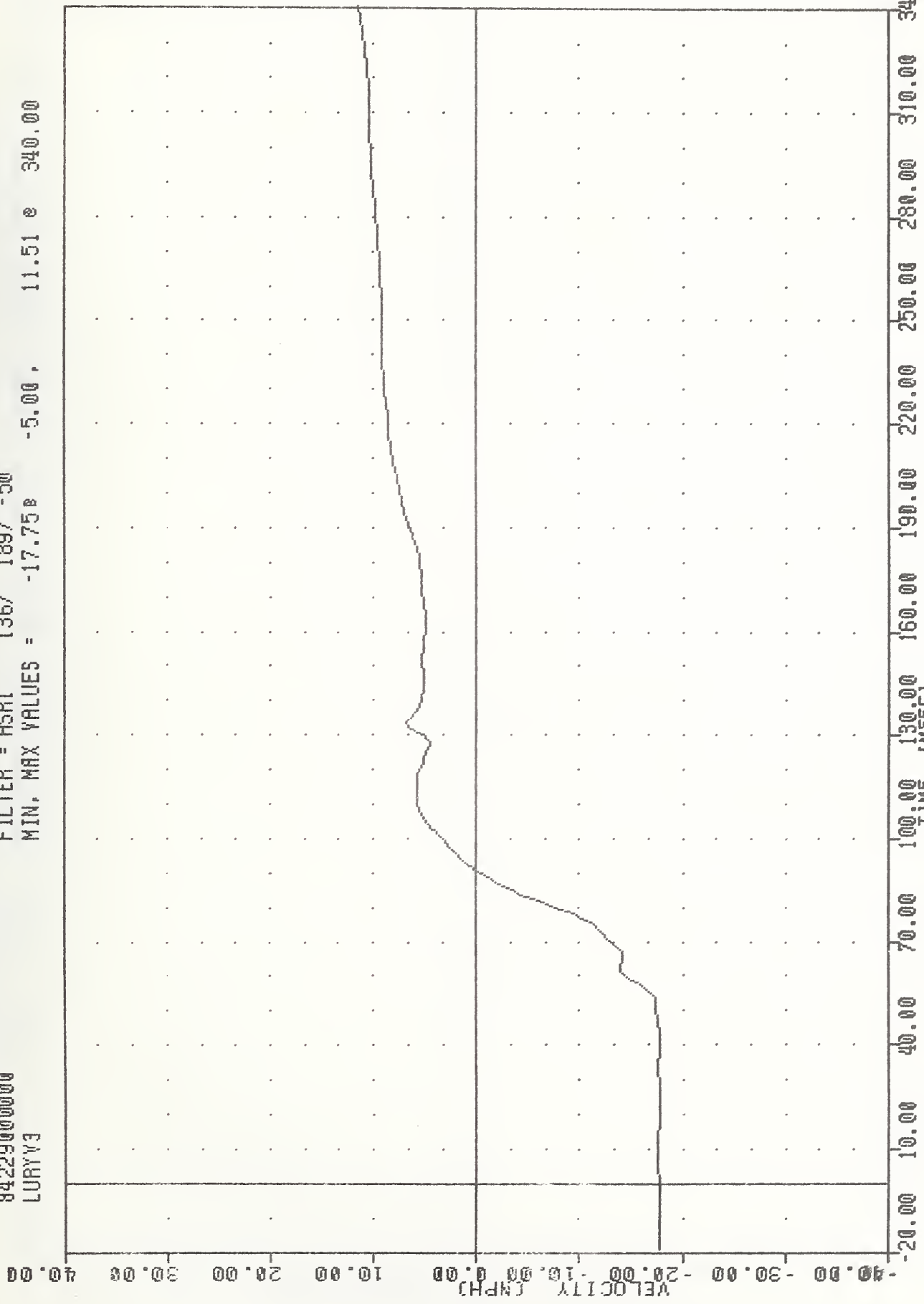
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LEFT UPPER AIR ACCELERATION Y AXIS

IHC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LURYV3

PLU1 DATE 24-AUG-84 11:29:48

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.75 11.51 0 340.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LURYG3

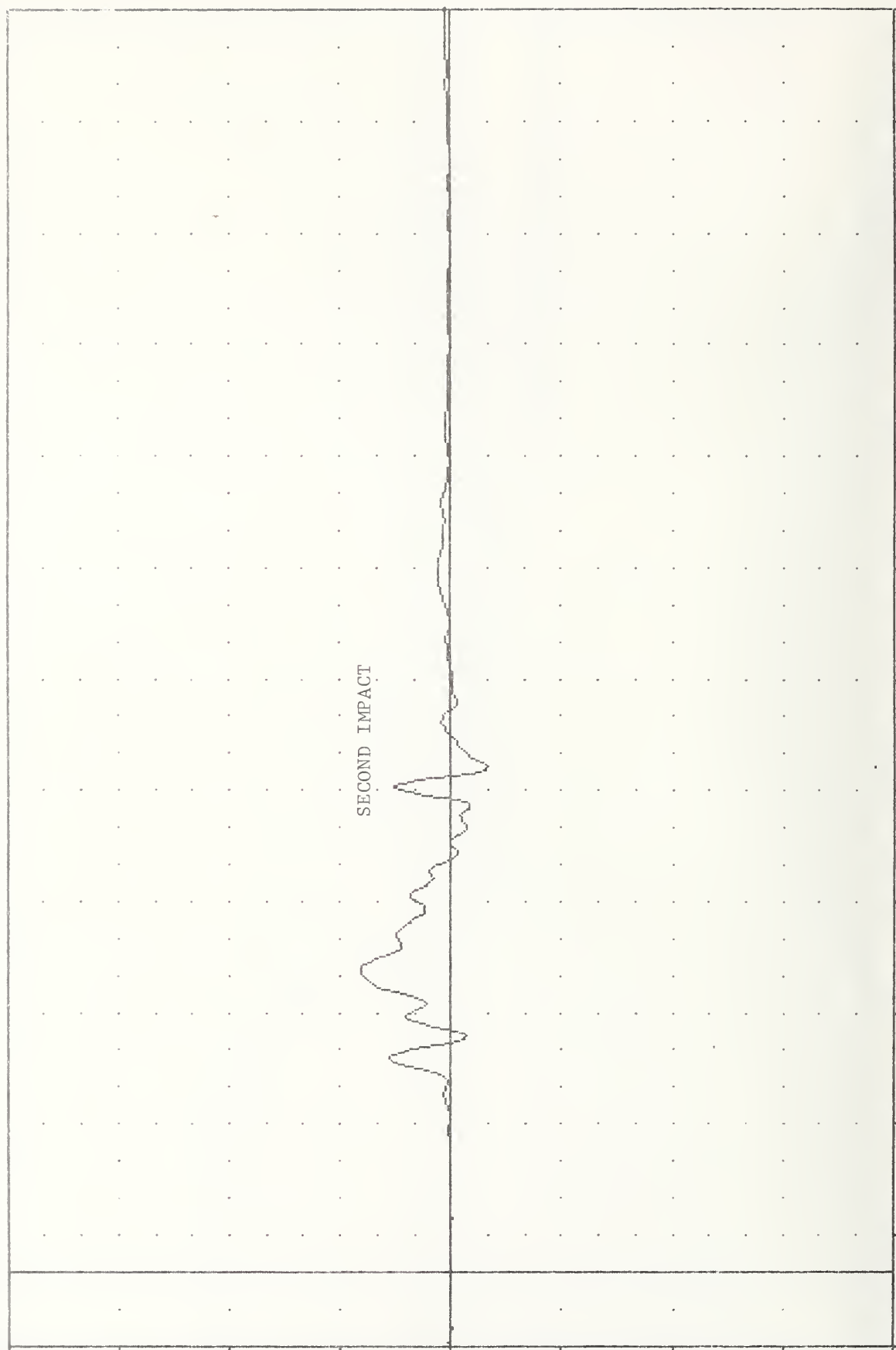
THC , 84081b
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LURYGC

PLU1 DATE 24-MUG-84 08:24:20

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -16.36 135.62, 40.75 81.25

ACCELERATION (G)



SECOND IMPACT

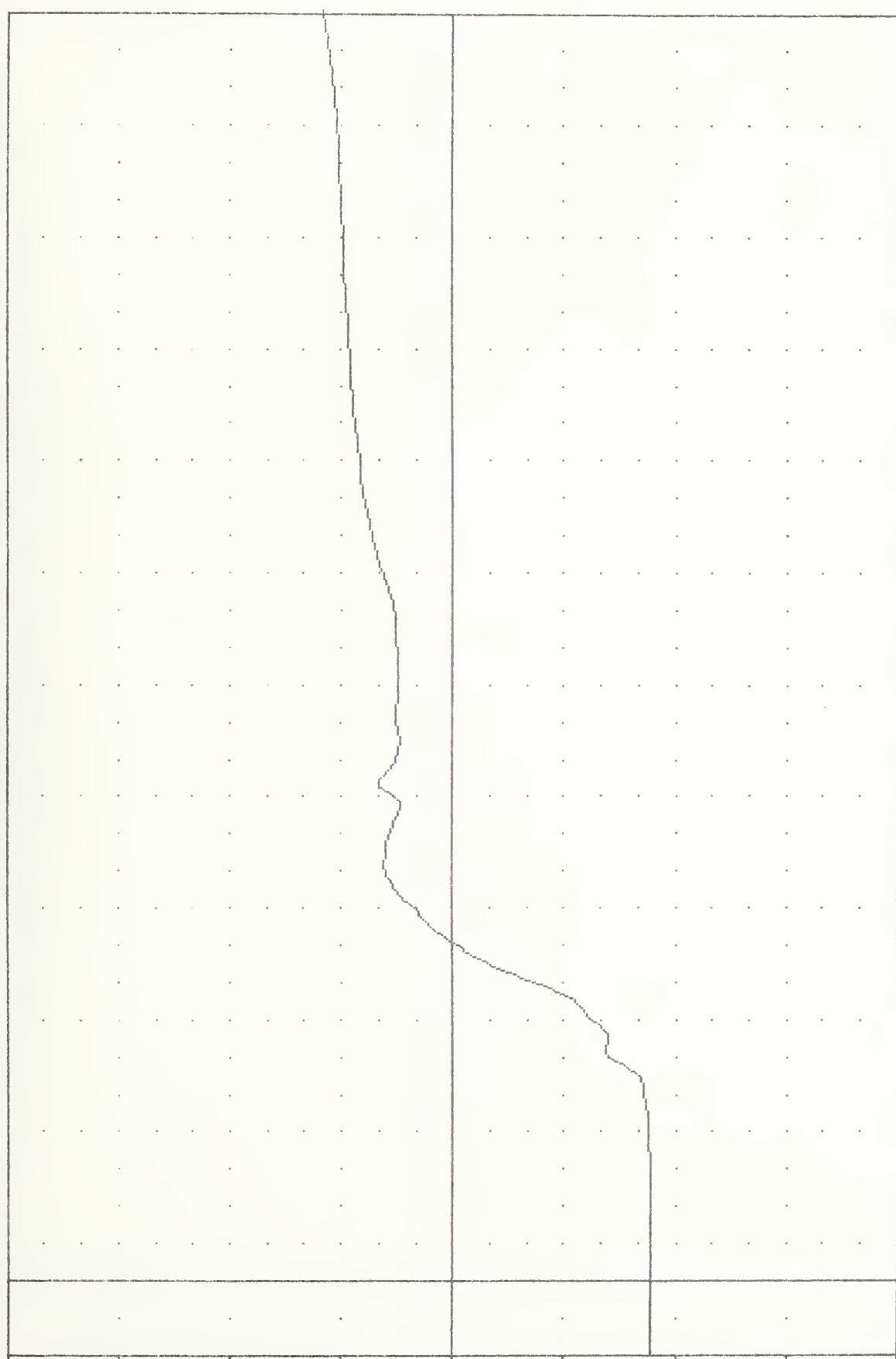
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LEFT UPPER RIB ACCELERATION -2 Y AXIS

TINL
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LURYVC

PLUI DATE 24-HUG-84 11:29:48

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -17.76 5.00, 11.72 340.00

VELOCITY (MPH)



TIME (MSEC)

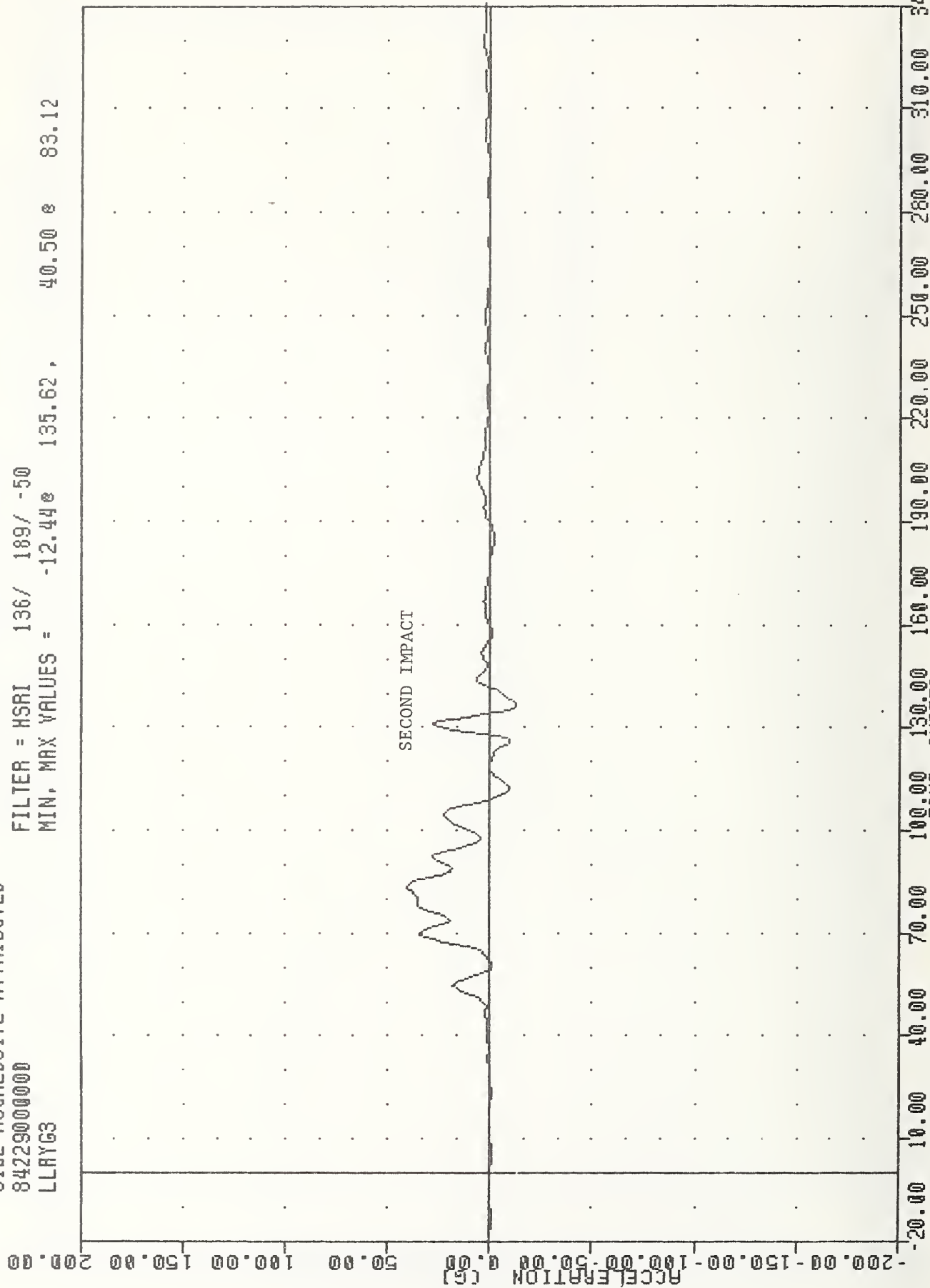
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LURYGC

THC , 840810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LLAG3

PLU: DR1C 24-HUG-04 W0:24:20

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -12.440 135.62, 40.50 8 83.12



TMC 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LLRYV3

PLUN DRIL 2 1106-02 11.29120

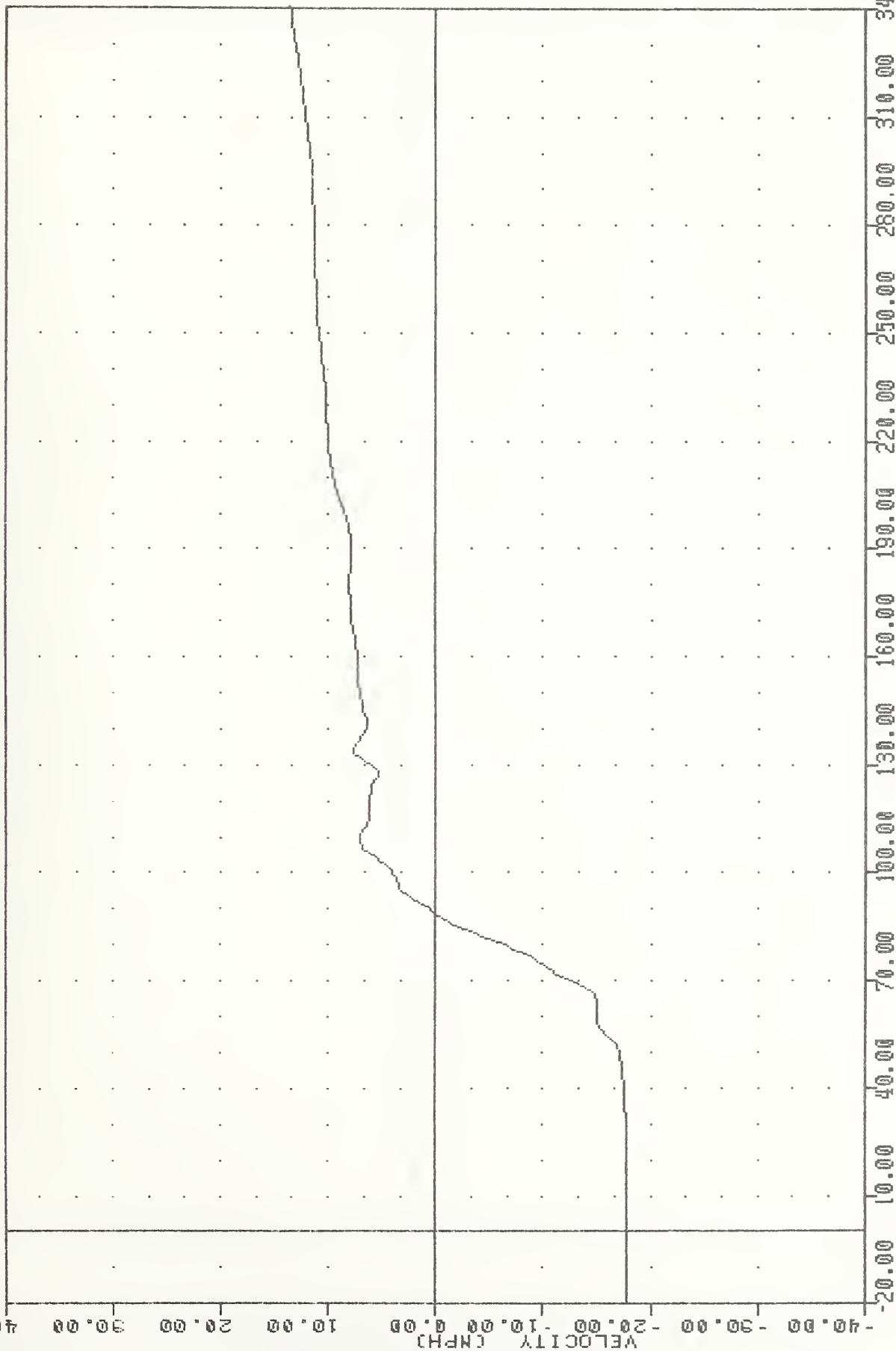
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -17.790

9.37, 13.58 * 340.00

40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00

B-61



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING LLRYG3

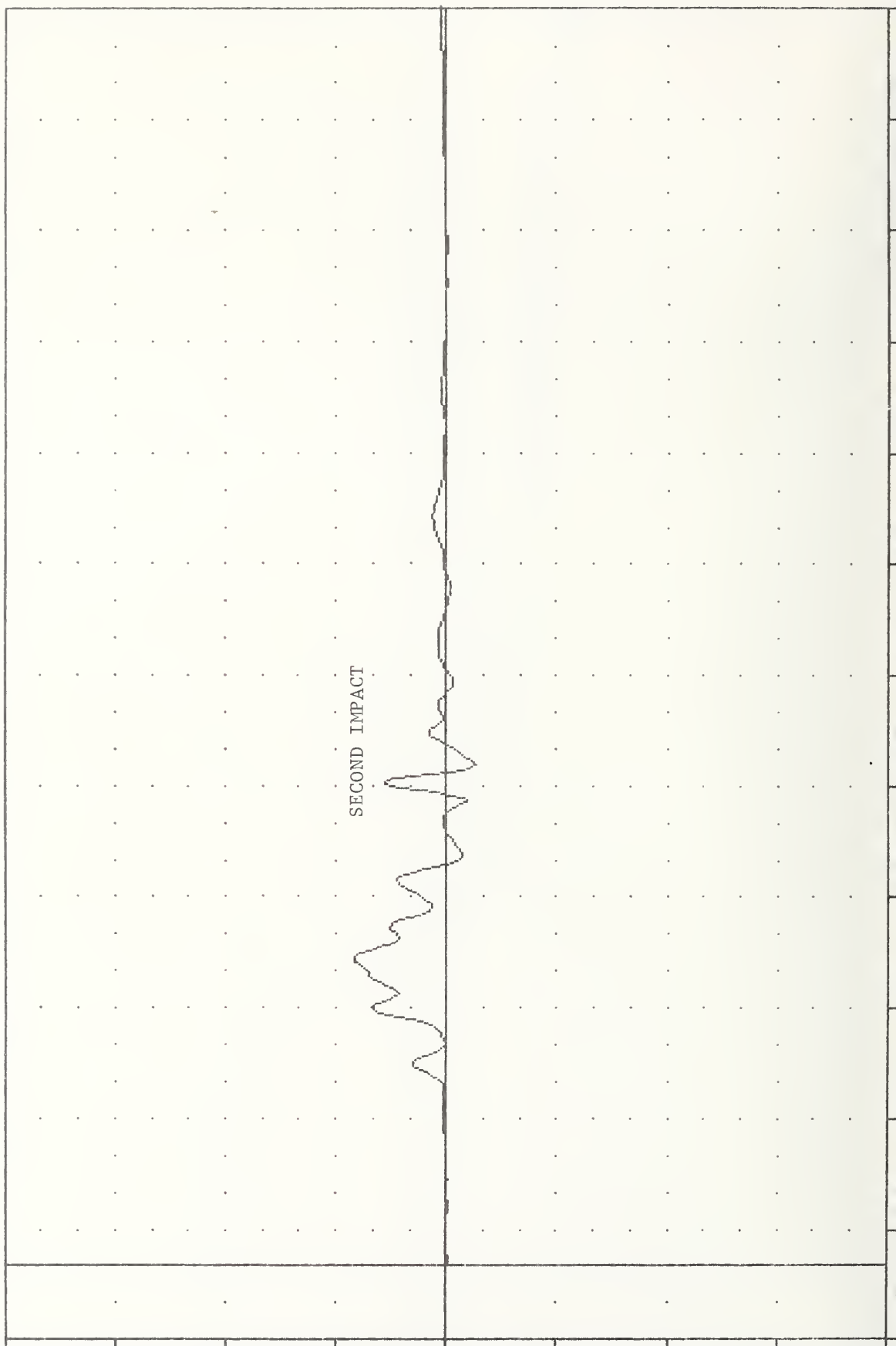
THU 840816
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 LLRYEC

PLUI DATE 24-HUE-84 08:24:26

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -13.43e 135.00, 41.96 e 82.50

ACCELERATION (G)



SECOND IMPACT

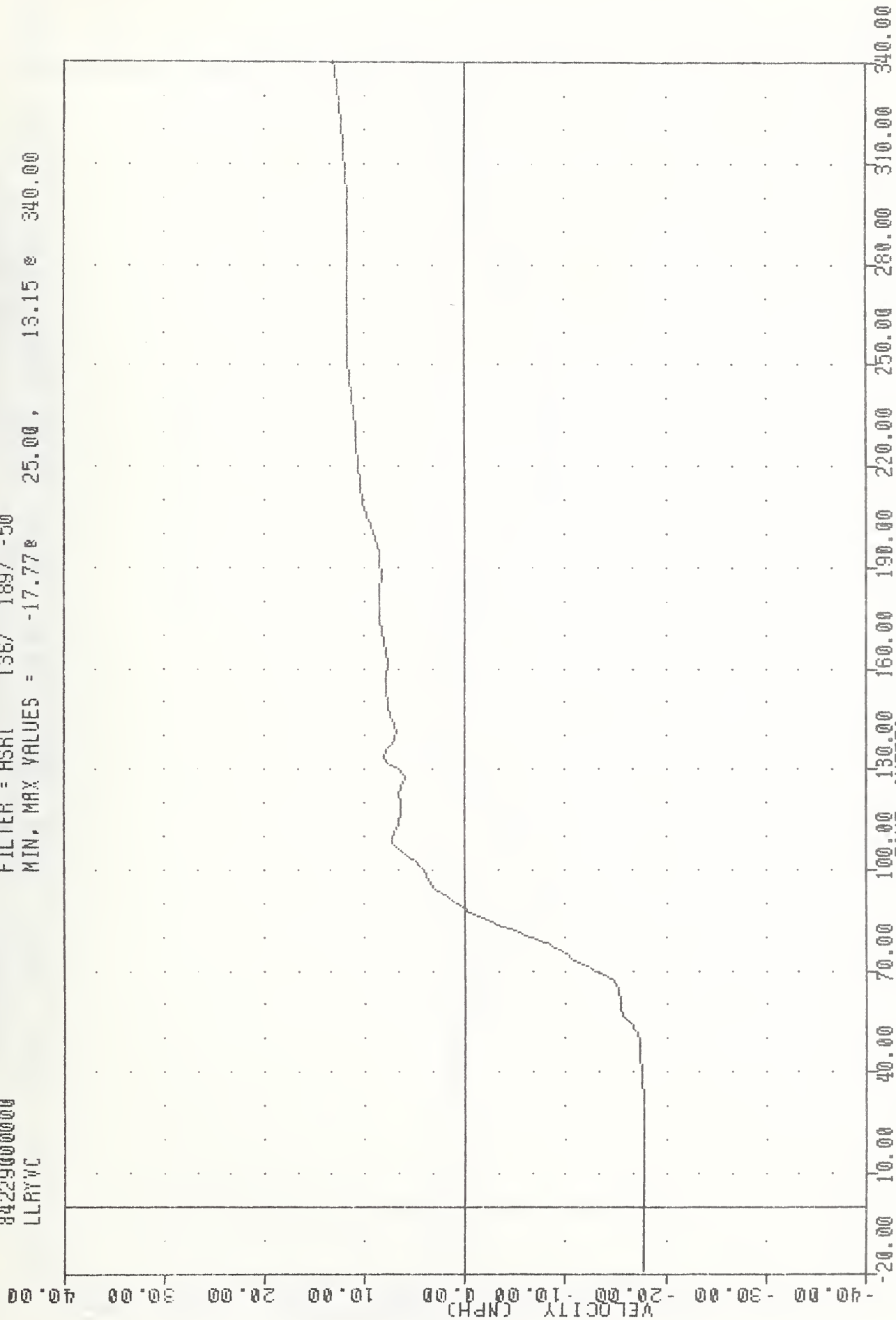
TIME (MSEC)

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER LEFT LOWER AIB ACCELERATION #2 Y AXIS

TIME 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LLRYVC

FLOW DATE 22 AUG 07 11:29:70

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -17.778 25.00, 13.15 340.00



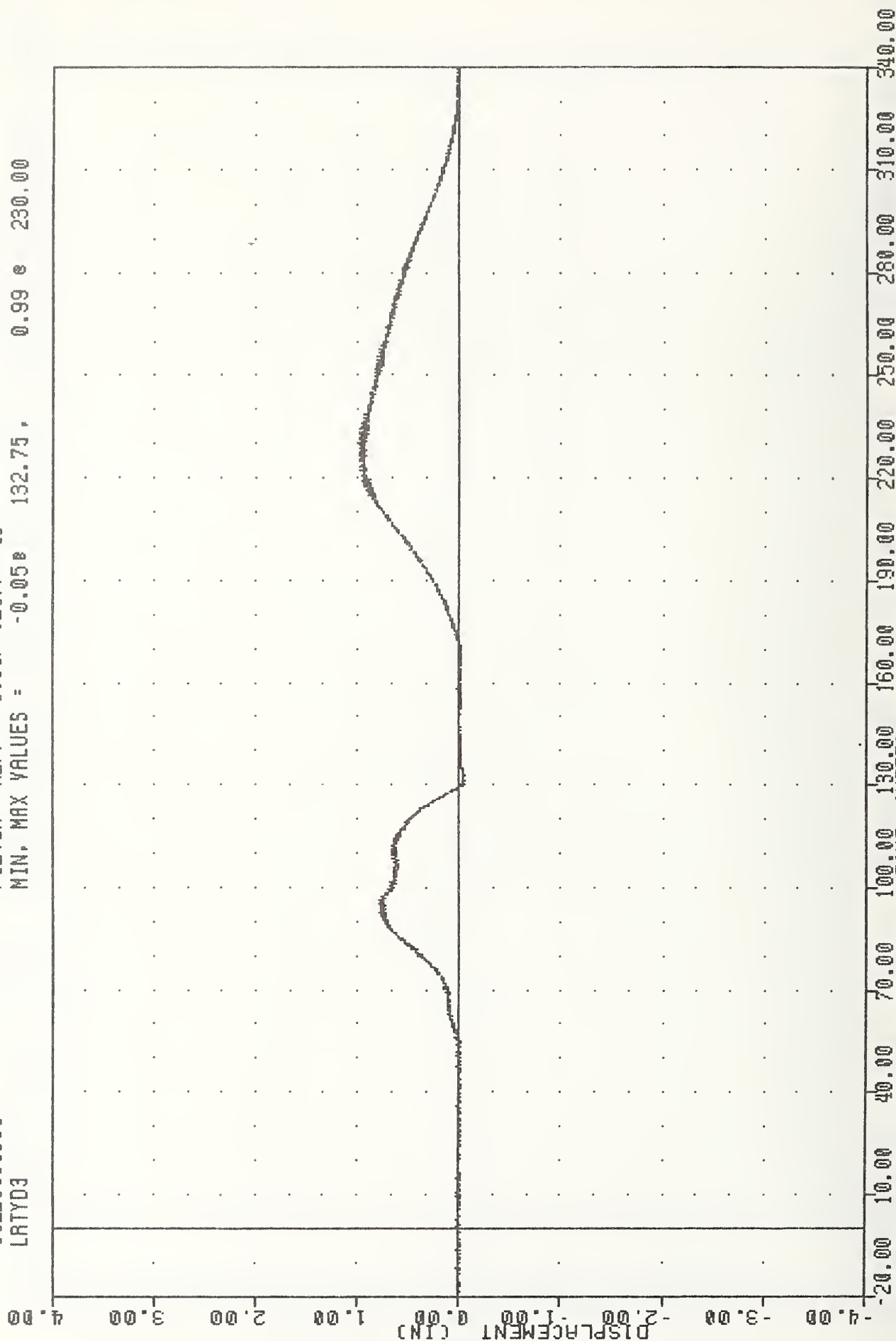
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LLRYVC

TRC , 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LRTYD3

PLUT DATE 24-AUG-84 08:25:57

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -0.058 132.75, 0.99 e 230.00



B-64

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

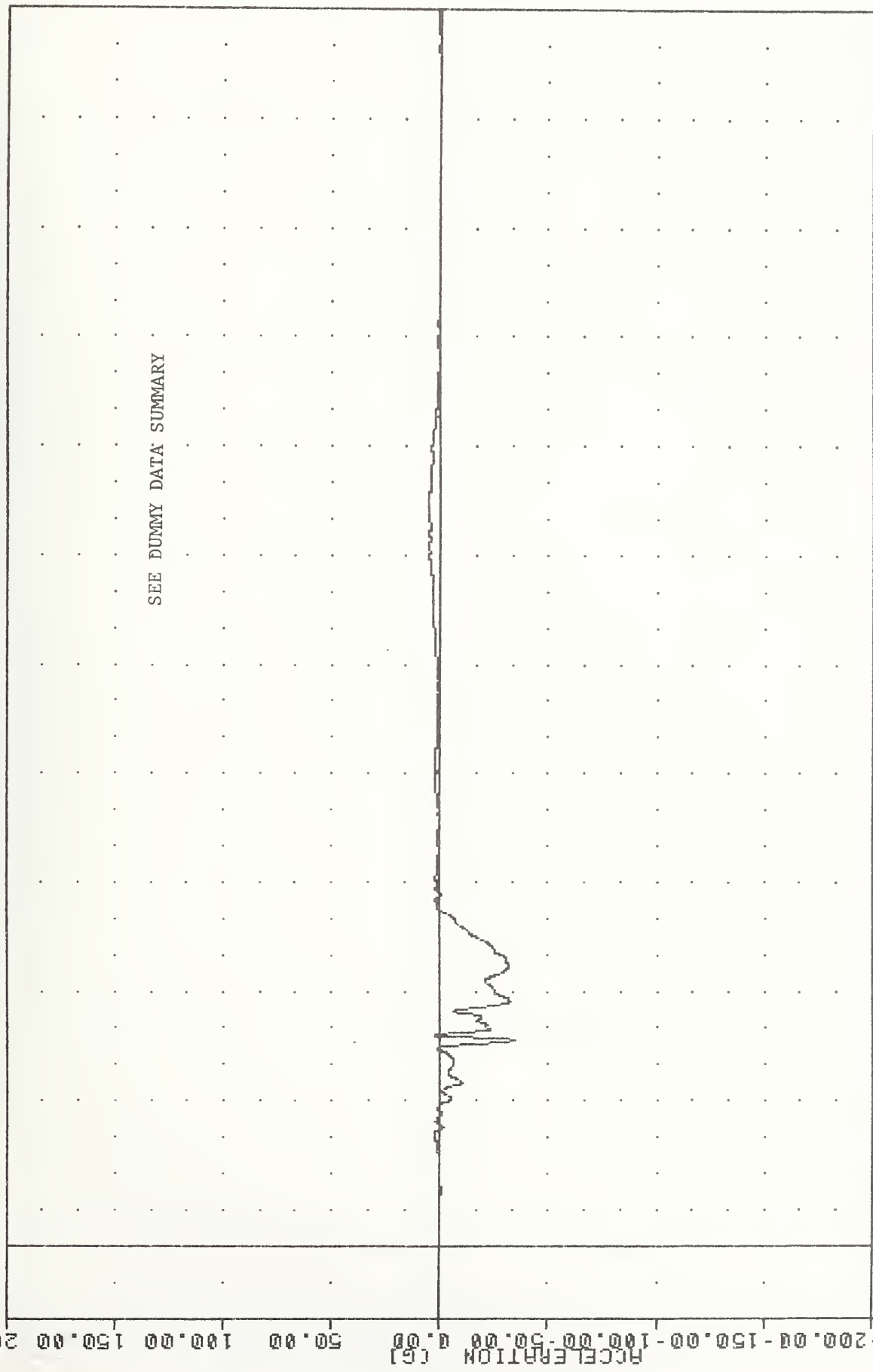
SIDE AGGRESSIVE ATTRIBUTES

84229000000

PEVXG3

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -34.348 56.50 , 5.83 205.50

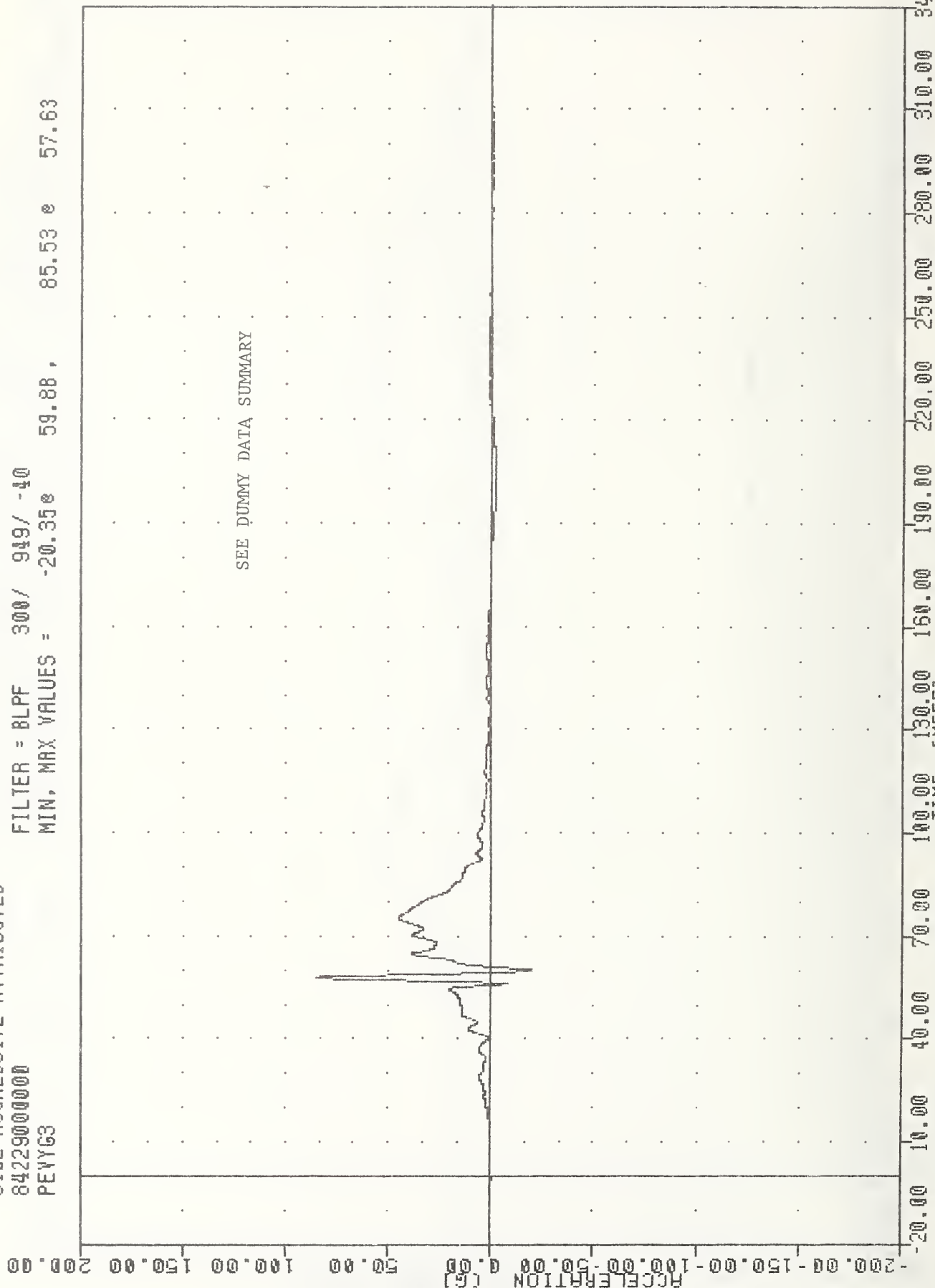


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER PELVIS ACCELERATION X AXIS

T... 081
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 PEVY63

PL... DAT... 2" UG... 00:25:50

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -20.350 59.88, 85.53 0 57.63



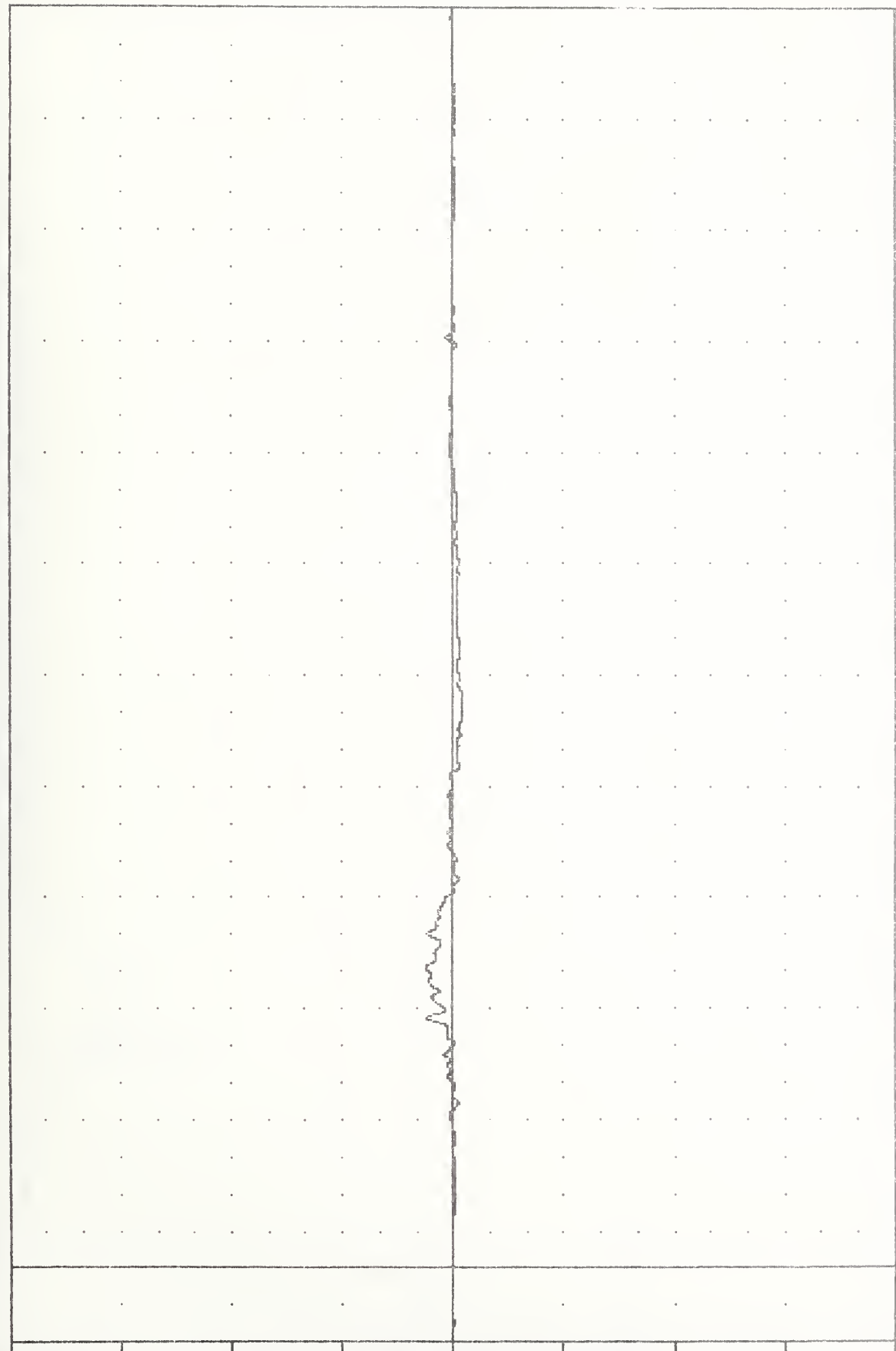
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER PELVIS ACCELERATION Y AXIS

T...081-
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 PEVZ63

PL DAT 2 006-00 0005:17

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -4.13e 150.25, 12.39 e 80.88

ACCELERATION (G)
 -200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 PASSENGER PELVIS ACCELERATION Z AXIS

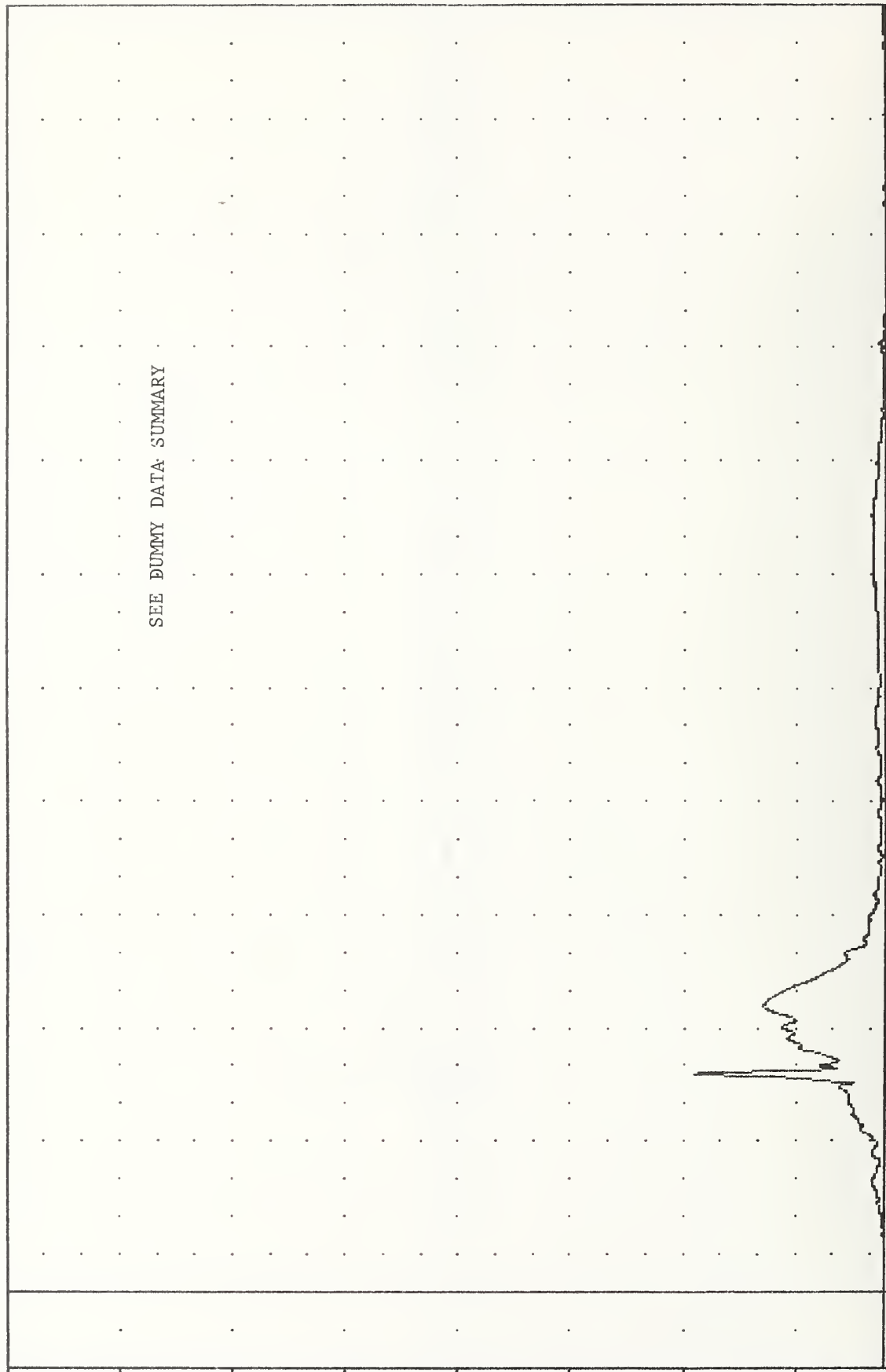
PLC. DATE 22 AUG 88 00:27

108.0
SIDE AGGRESSIVE ATTRIBUTES
84229000000
PEVRG3

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = 0.030 10.00, 85.60 0 57.63

SEE DUMMY DATA SUMMARY

ACCELERATION (G)



-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
PASSENGER PELVIS RESULTANT

FLUOR DRILL 27 d106 07 11.31.20

0408.00
SIDE AGGRESSIVE ATTRIBUTES

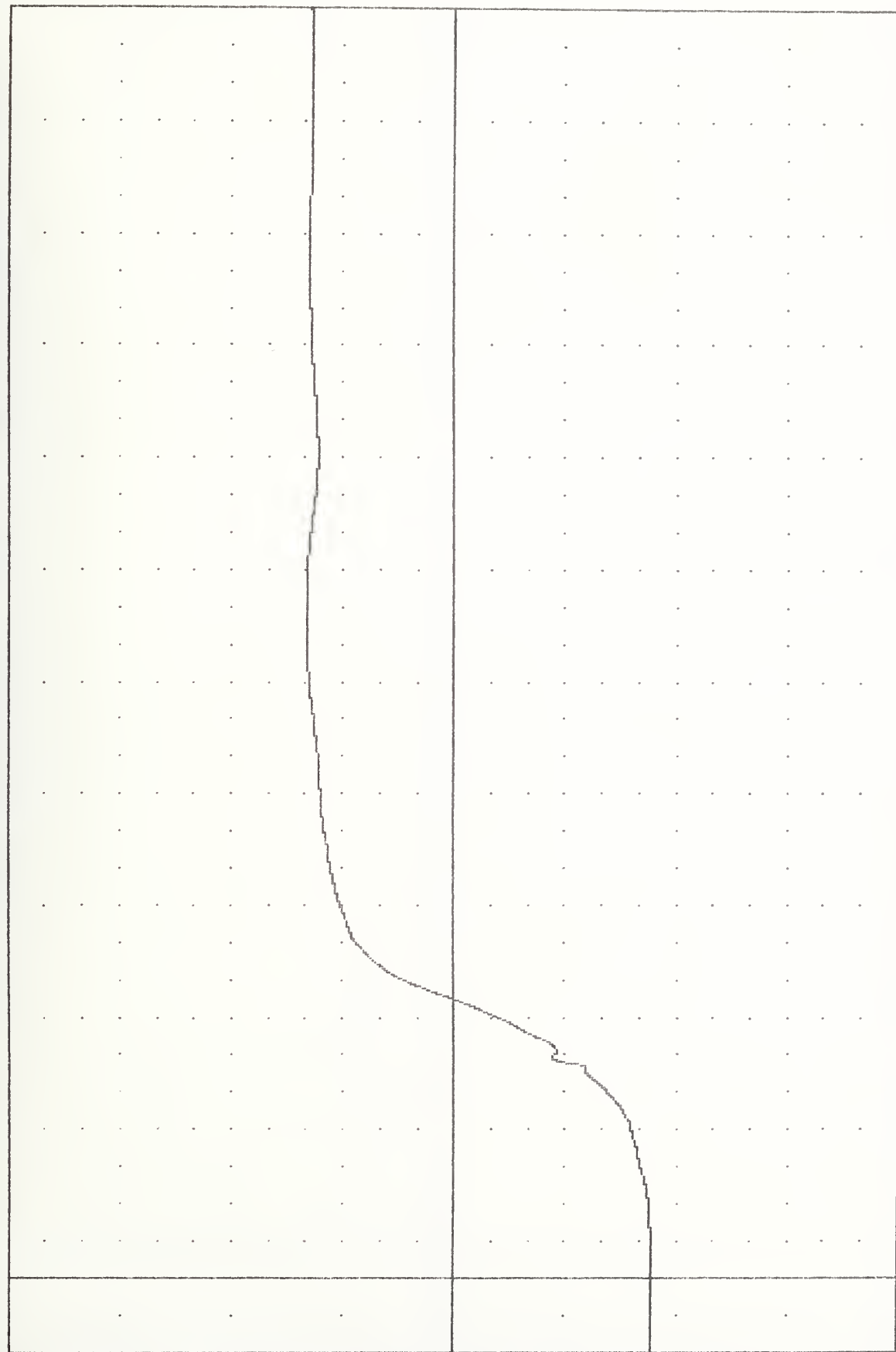
84229000000

PEVYV3

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -17.70B -20.00, 13.24 8 184.25

VELOCITY (MPH) -40.00 -30.00 -20.00 -10.00 0.00 10.00 20.00 30.00 40.00



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

45 DEGREE CRABBER VOLKSWAGEN RABBIT INT: FIXED POLE

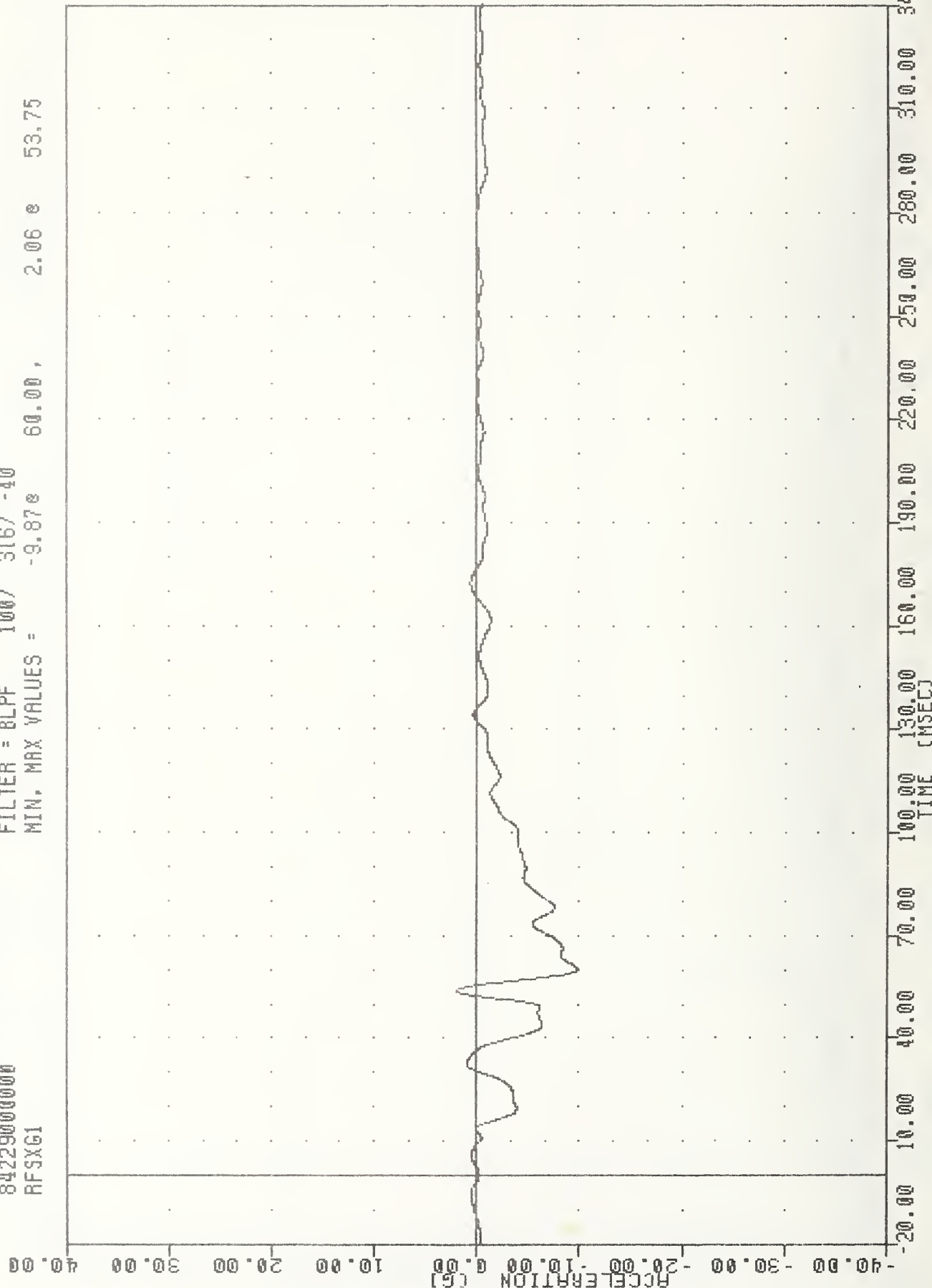
DEL R V USING PEVYG3

TIME DRILL 23 AUG 67 00:25:00

TIME 040610
SIDE AGGRESSIVE ATTRIBUTES

842290000000
FILTER = 8LPF 100/ 316/ -40

RFSXG1
MIN. MAX VALUES = -9.878 60.00, 2.068 53.75



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT FRONT STILL ACCELERATION X AXIS

TRC , 840816 PLOT DATE 24-AUG-84 08:25:57

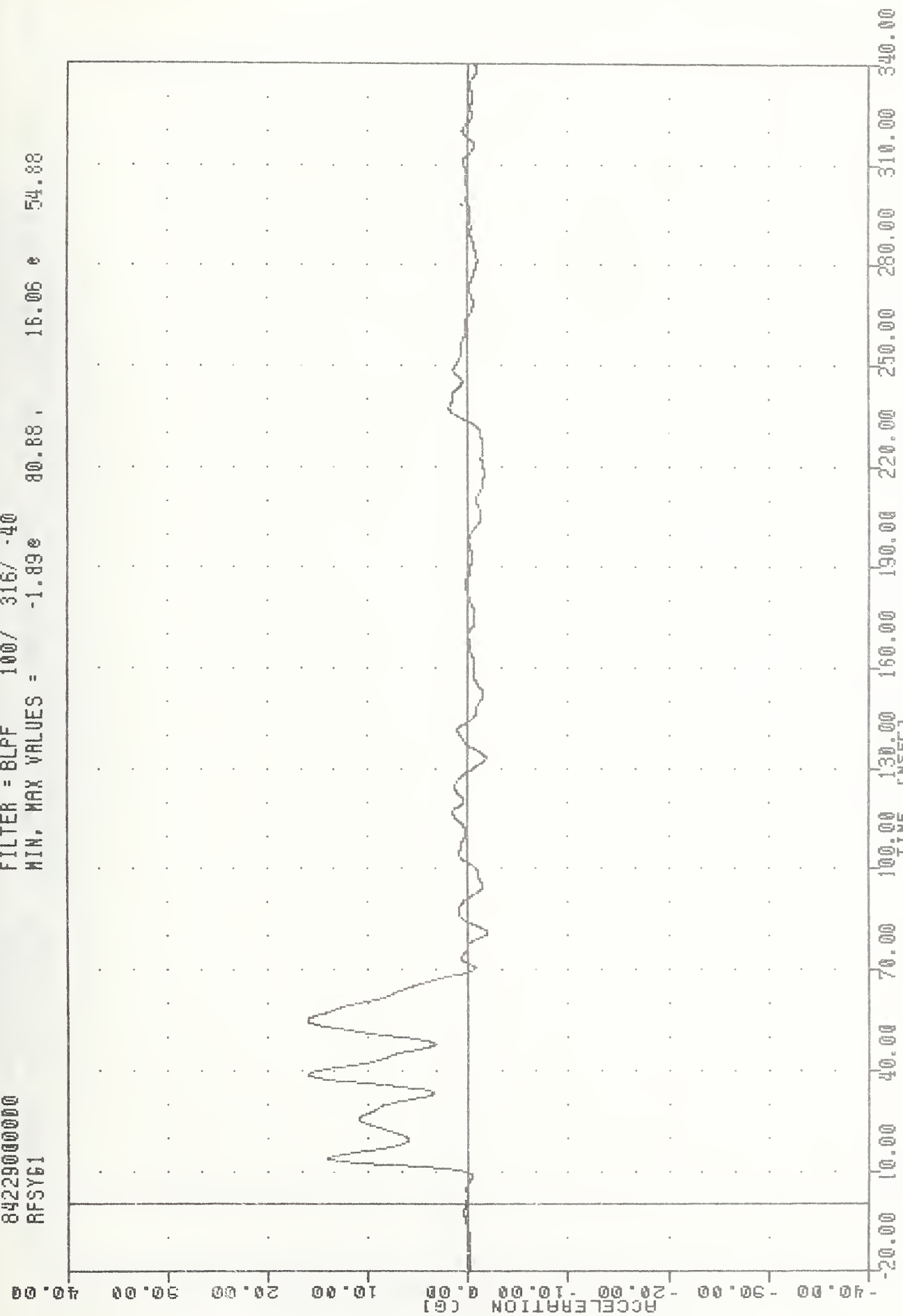
SIDE AGGRESSIVE ATTRIBUTES

84229000000

RFSY61

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -1.89e 80.88, 16.06 e 54.88



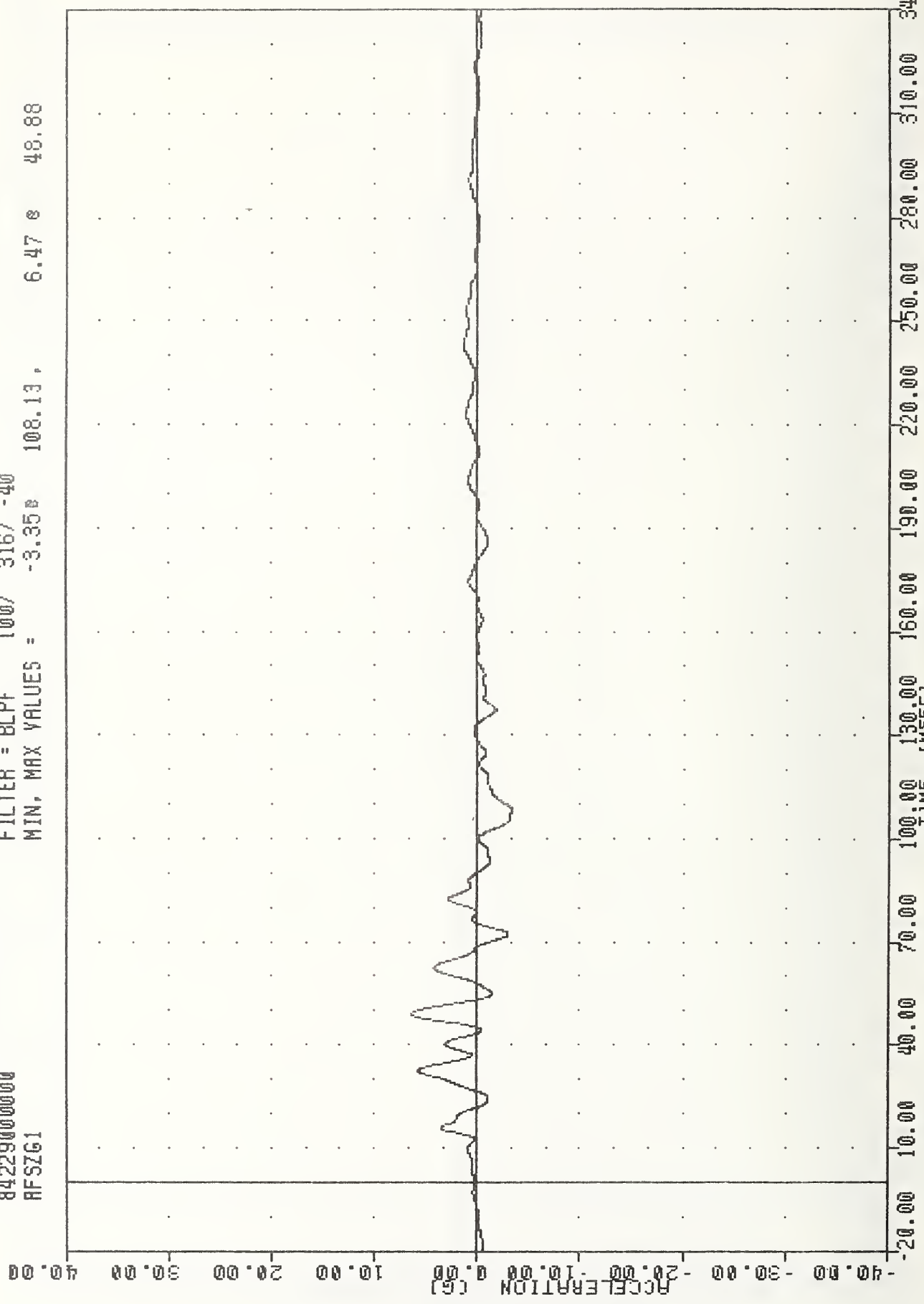
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT FRONT SILL ACCELERATION Y AXIS

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 RFSZG1

PLOT DATE 24-AUG-84 08:25:57

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -3.35 108.13, 6.47 48.88



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE RIGHT FRONT STILL ACCELERATION 7 AXIS

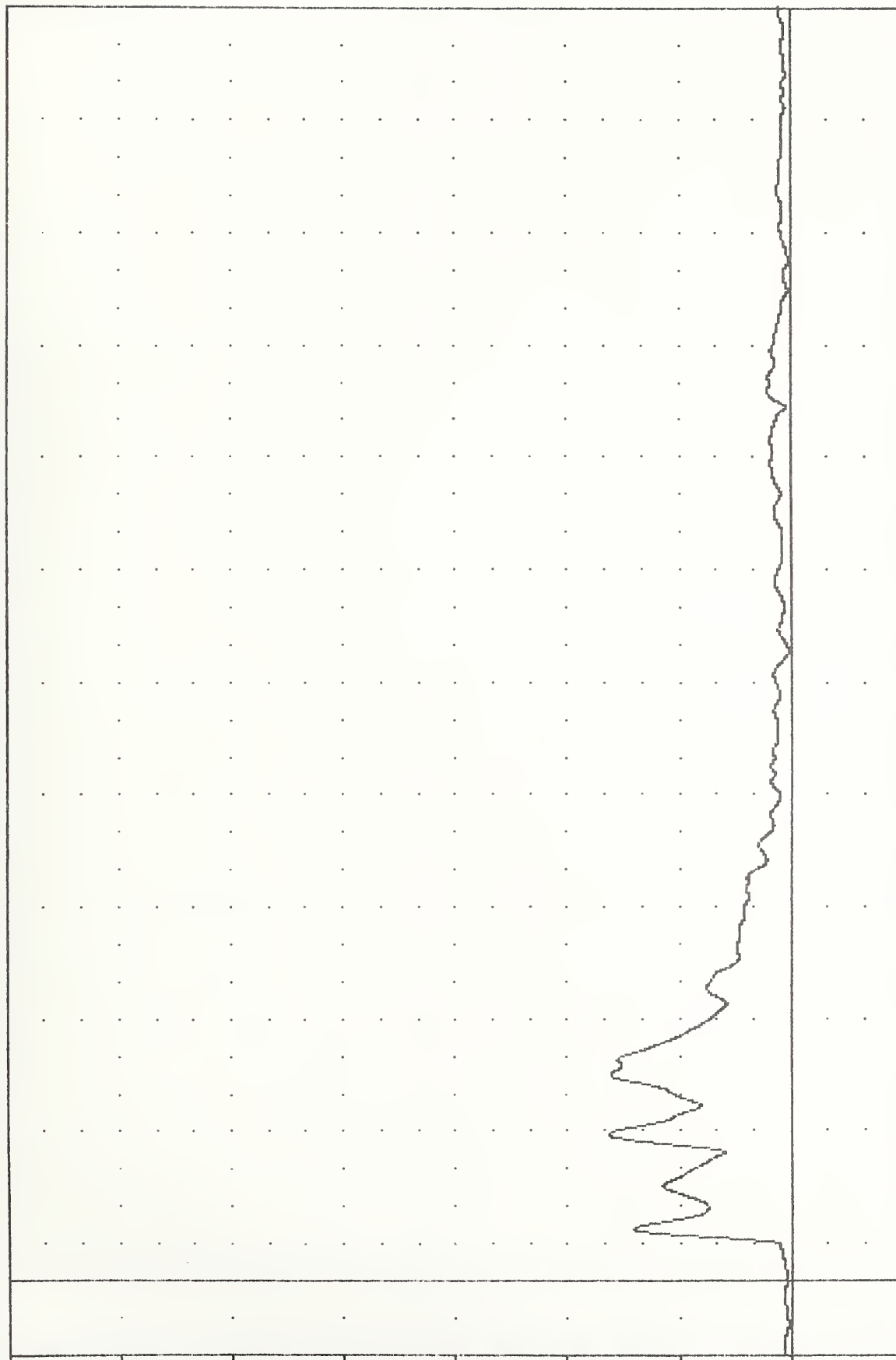
IML 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 RFSRG1

PLU1 DATE 24-MUG-84 08:27:03

FILTER = 8LPF 100/ 316/ -40

MIN. MAX VALUES = 0.12 168.25, 16.26 38.88

ACCELERATION (G)

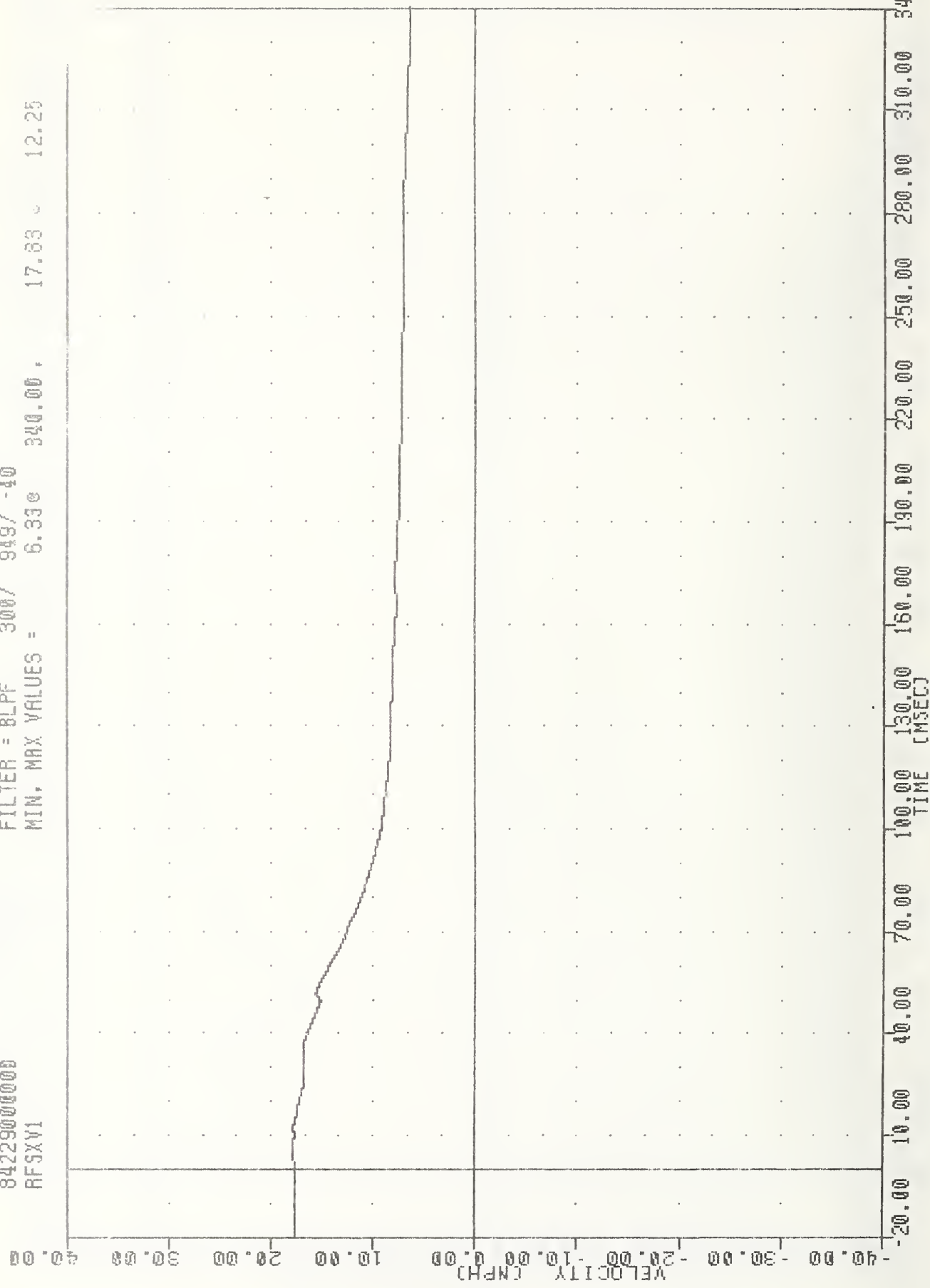


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE RIGHT FRONT SILL RESULTANT

INC 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 RFSXV1

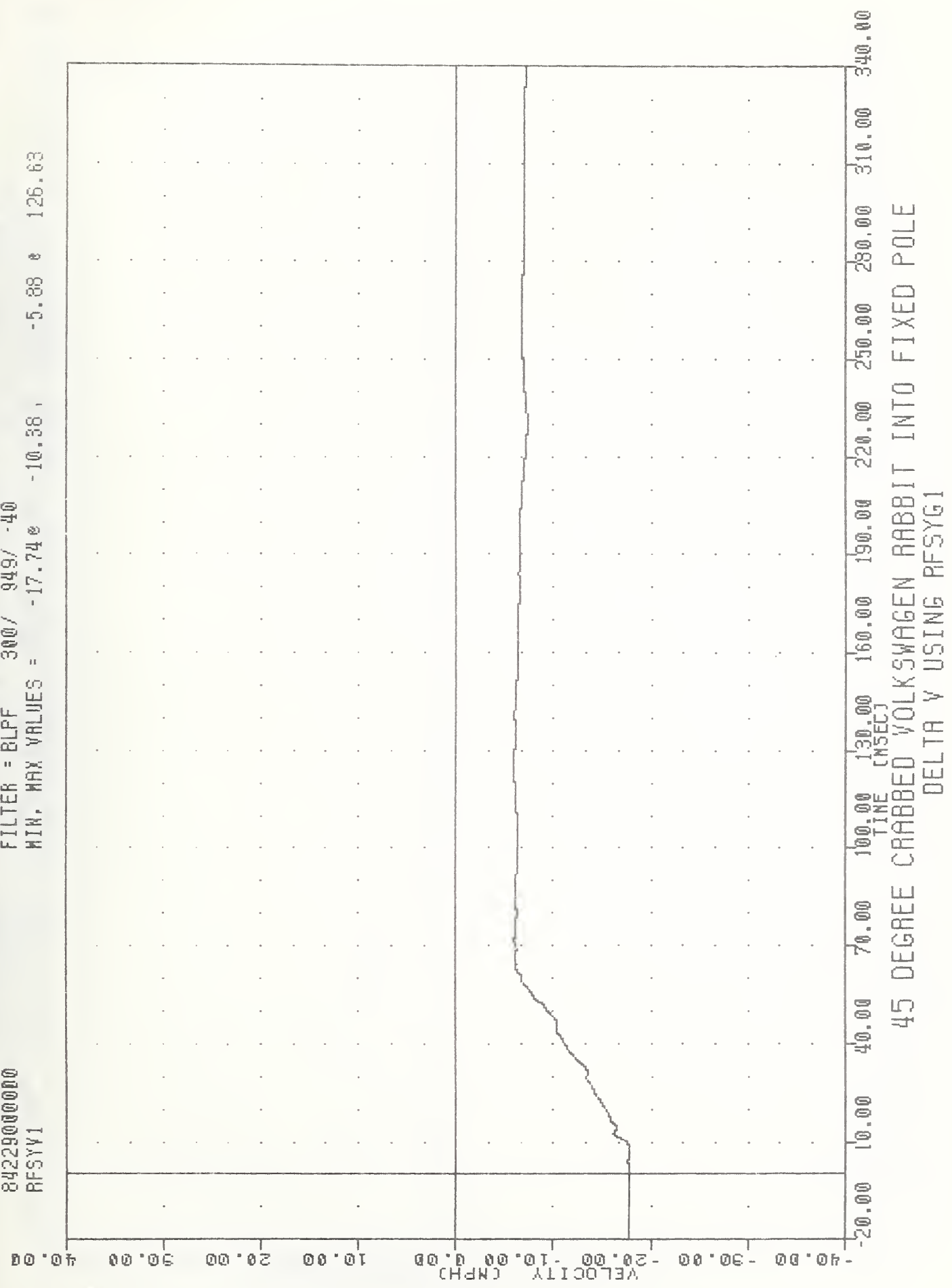
FLUT DRIL 2x 11UG-04 11.31220
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 6.330 340.00, 17.83 12.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING RFSXG1

Tnc 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 RFSYV1

PLU1 DA1C 24ndB-04 11.112e
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -17.74e -10.38 , -5.88 e 126.63



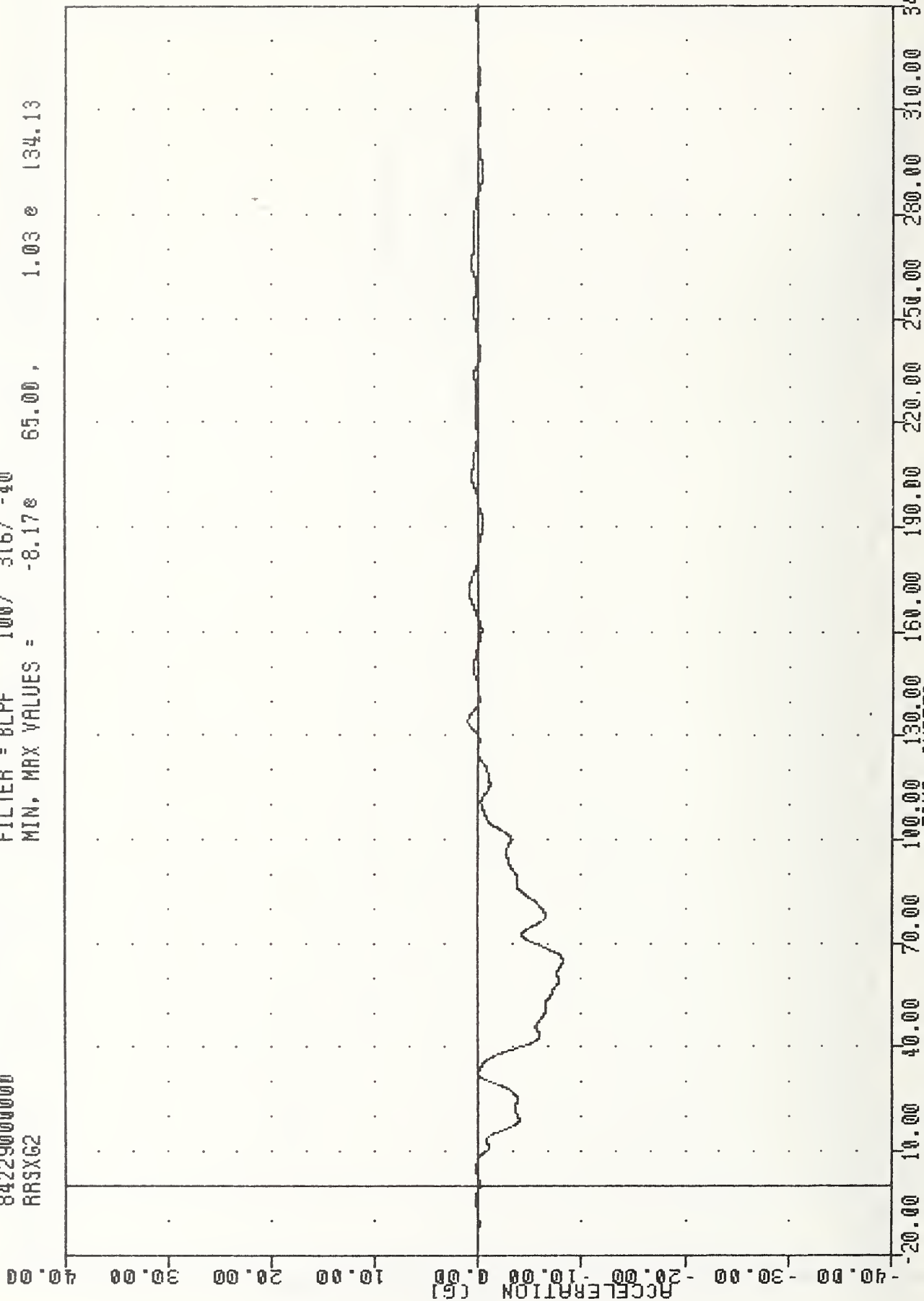
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING RFSYG1

INL , 840810
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 RRSXG2

PLU1 DATE 24-JUG-84 WD:25:37

FILTER = BLPF 100/ 316/ -40

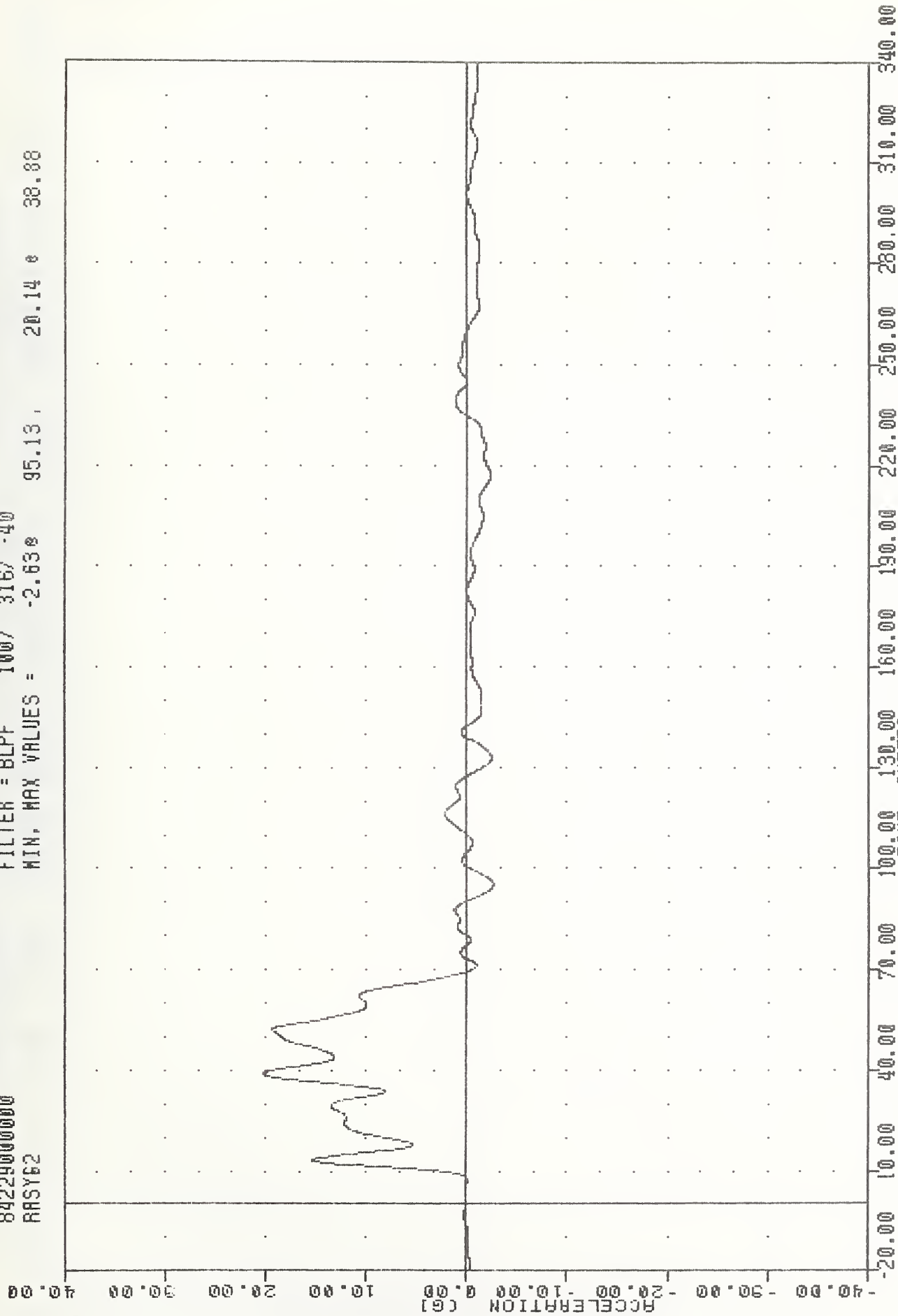
MIN, MAX VALUES = -8.17e 65.00, 1.03 e 134.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE RIGHT REAR SILL ACCELERATION X AXIS

TML 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 RASY62

PLU1 DR1c 24-nUG-04 00.25157
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -2.638 95.13, 20.14 0 38.88

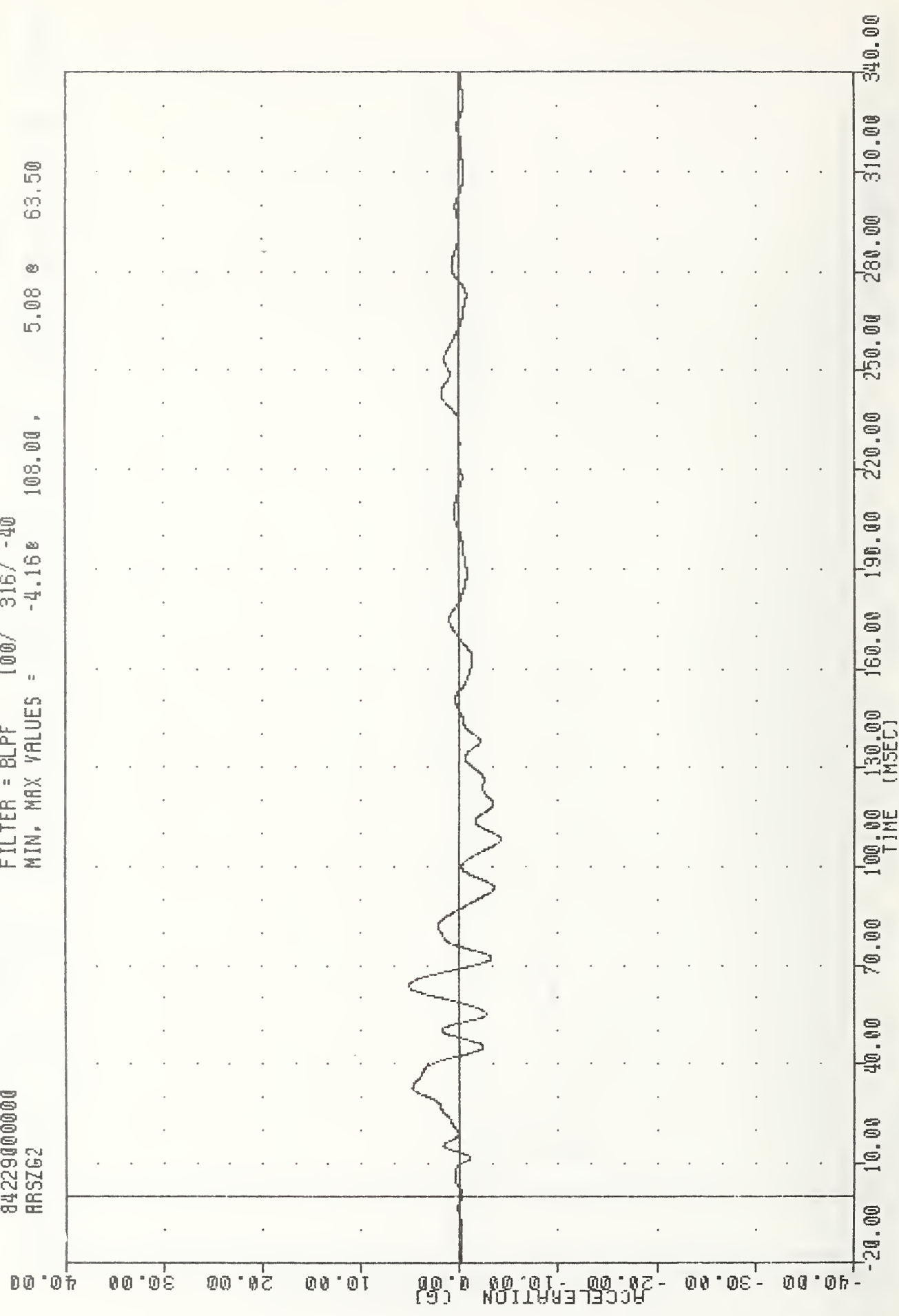


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE RIGHT REAR SILL ACCELERATION Y AXIS

PLU1 DATE 24-AUG-04 00:25:07

INL 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
ARSZG2

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -4.16e 108.00, 5.08 e 63.50

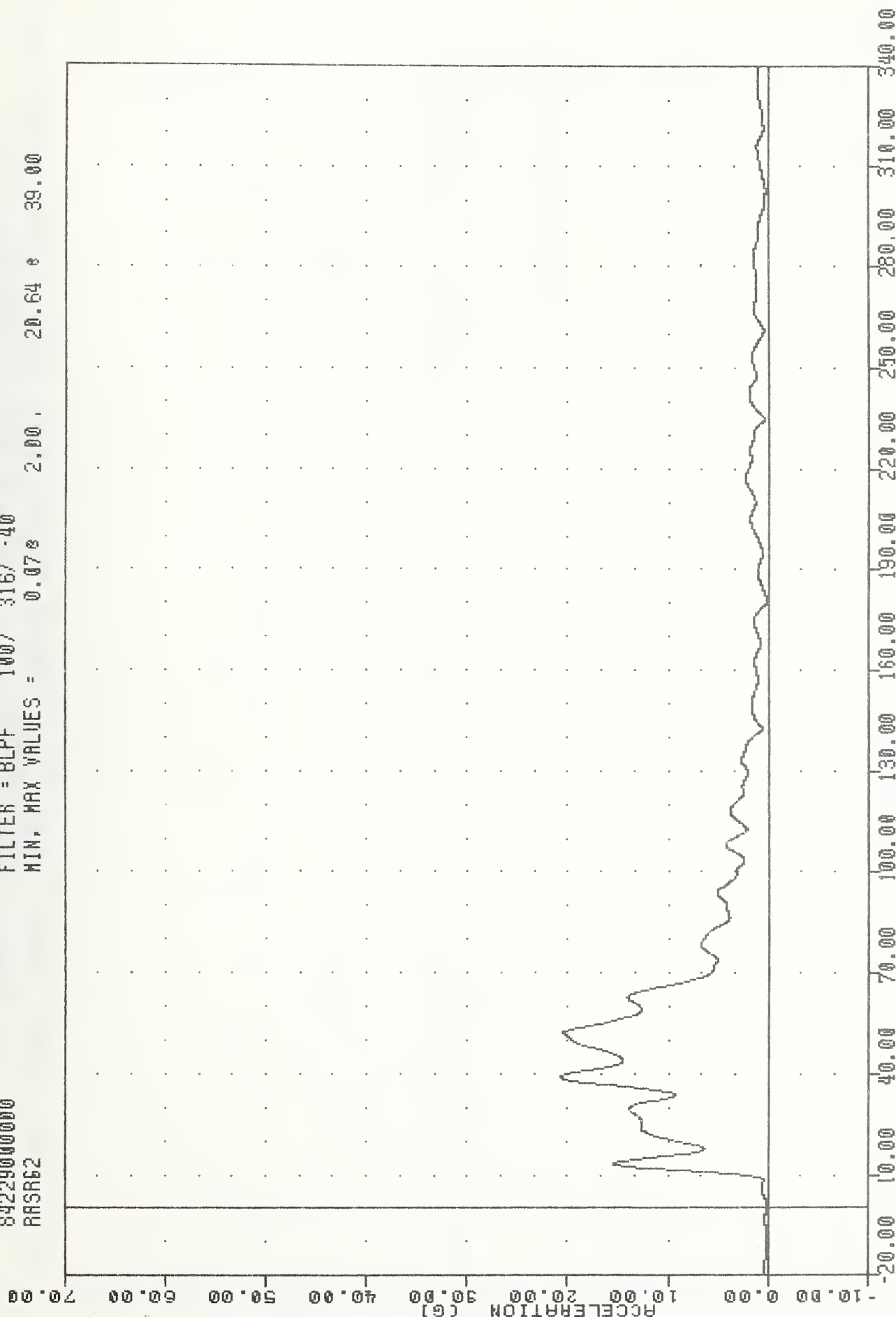


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

Tnc 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 RASR62

PLU1 DR1C 24-nU6-04 no.27:00

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = 0.078 2.00 20.64 39.00

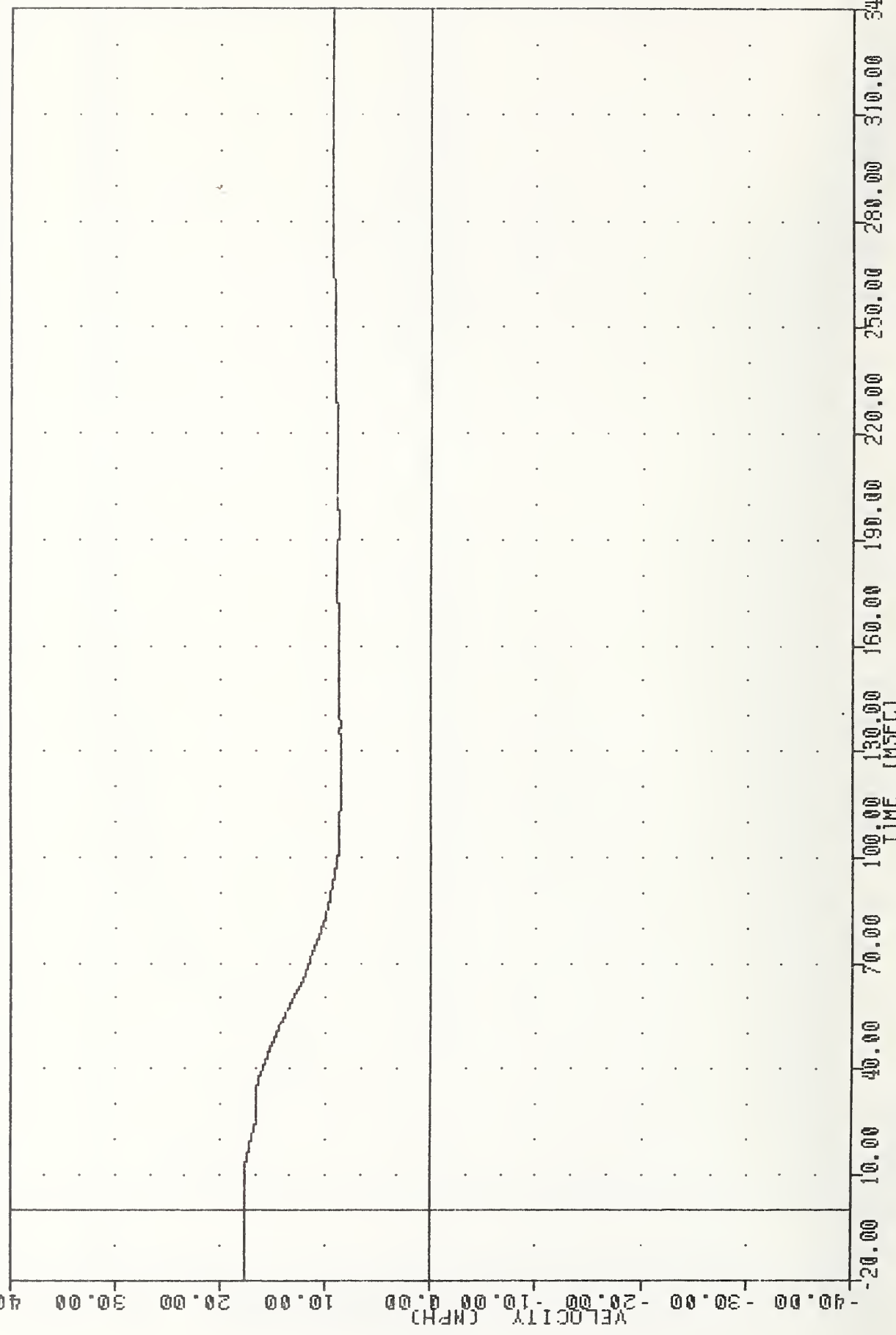


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE RIGHT REAR SILL RESULTANT

PLU1 DRILL 24 AUG 04 11:31:20

INC ,040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
RRSXV2

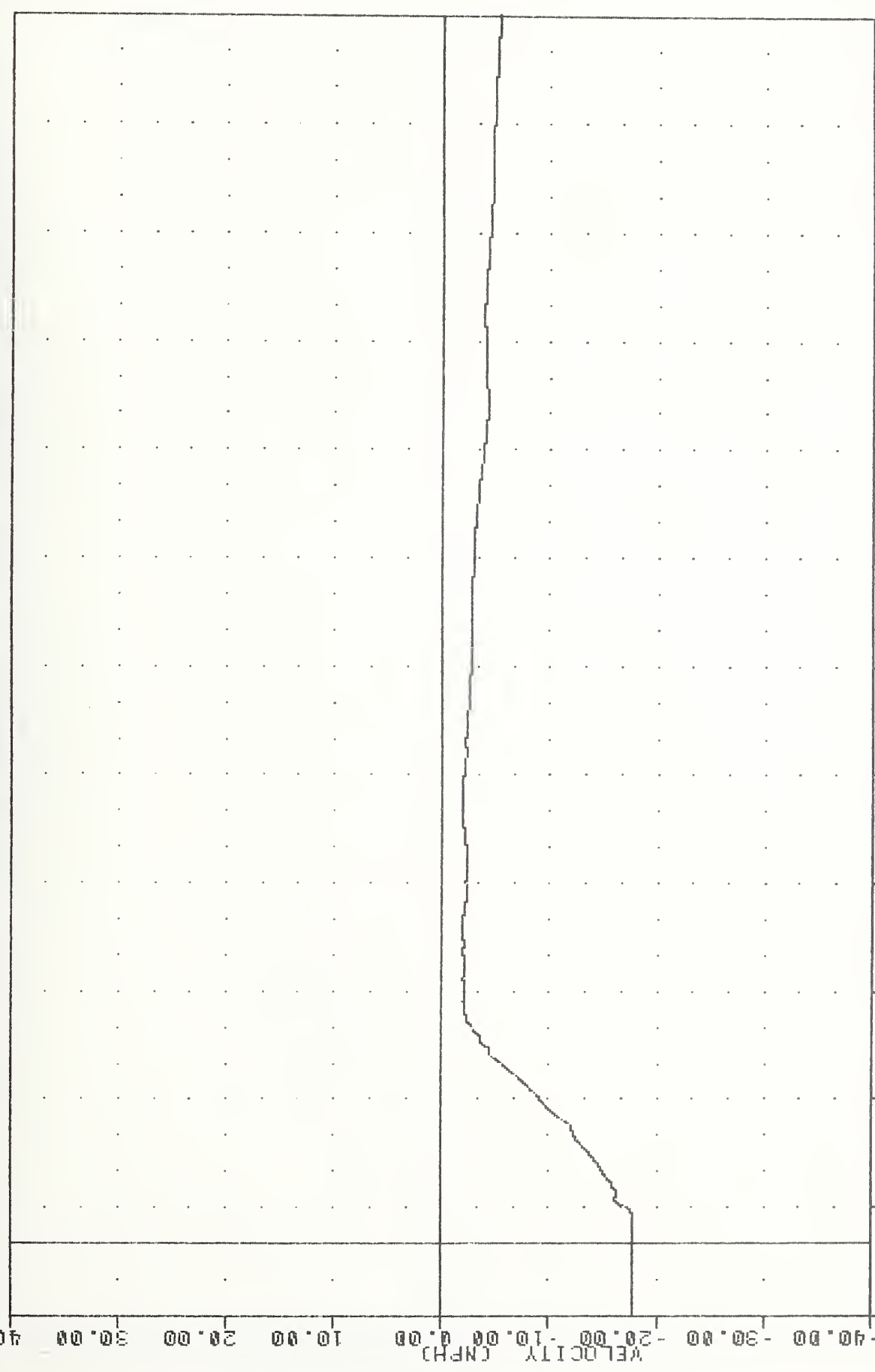
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 8.528 120.13, 17.74 3.75



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RRSXG2

7mc 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
RRSYV2

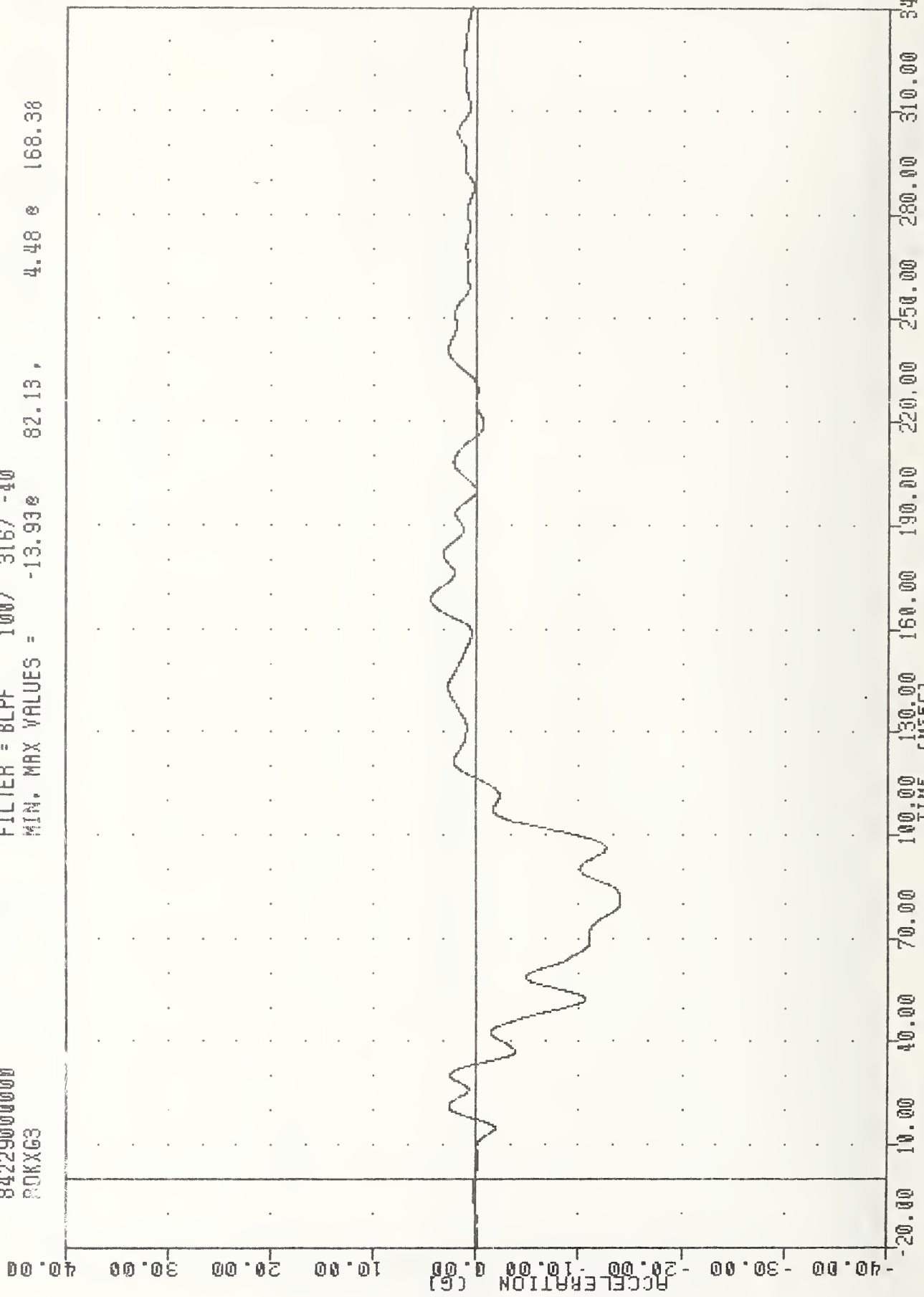
Plot DRIL 23 JUG-02 11:51:20
FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -17.73e -10.00, -1.80 e 124.00



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING RRSYG2

PLU1 DR1C 24-AUG-04 00:25:37
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -13.938 82.13 4.48 8 168.38

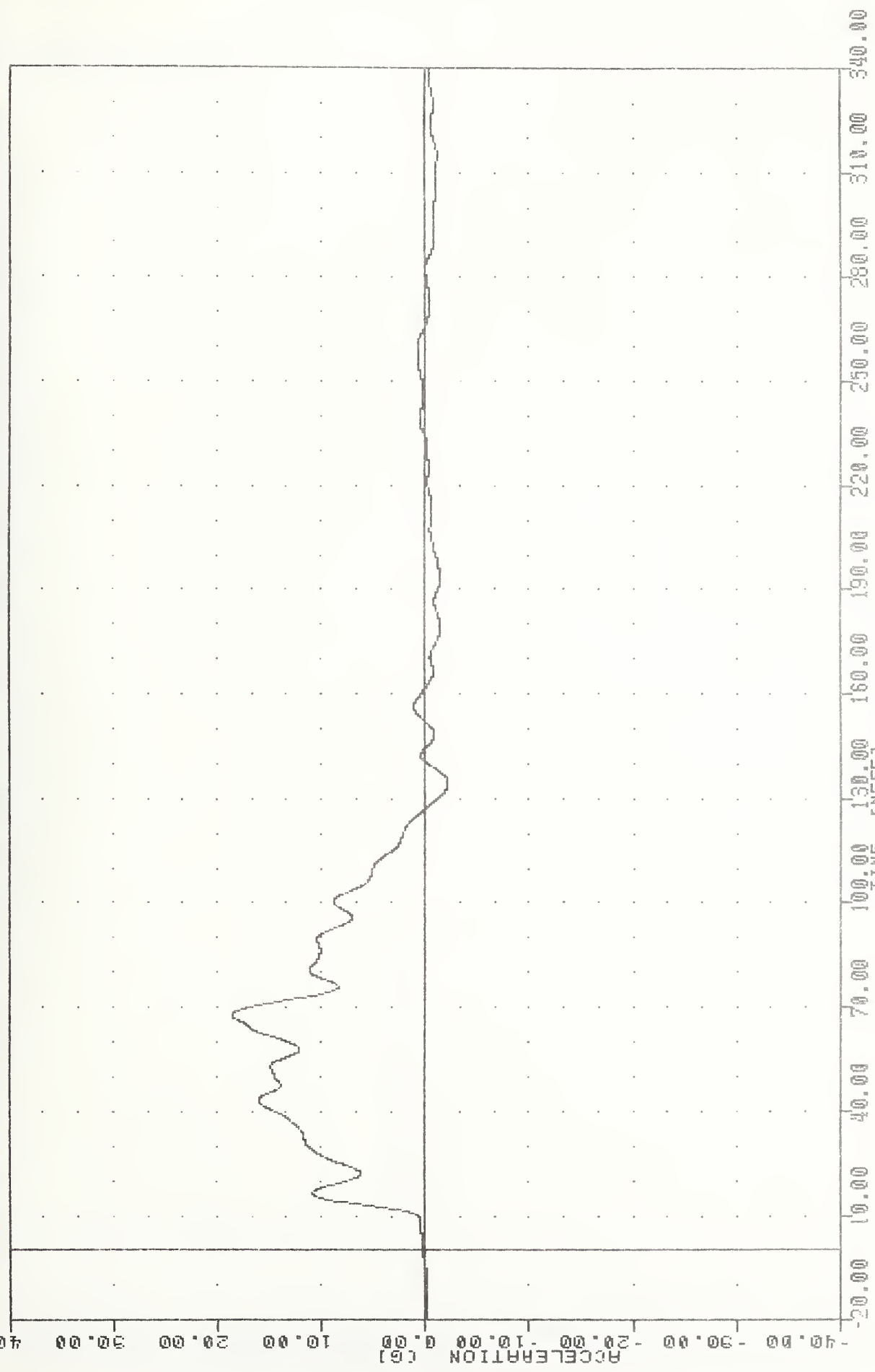
INC 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 ROKXG3



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE REAR DECK ACCELERATION X AXIS

INL , 040810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 ROKY63

PLU: DRIC 24-nU6-04 00-25:07
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -2.10e 134.38. 18.60 e 67.75



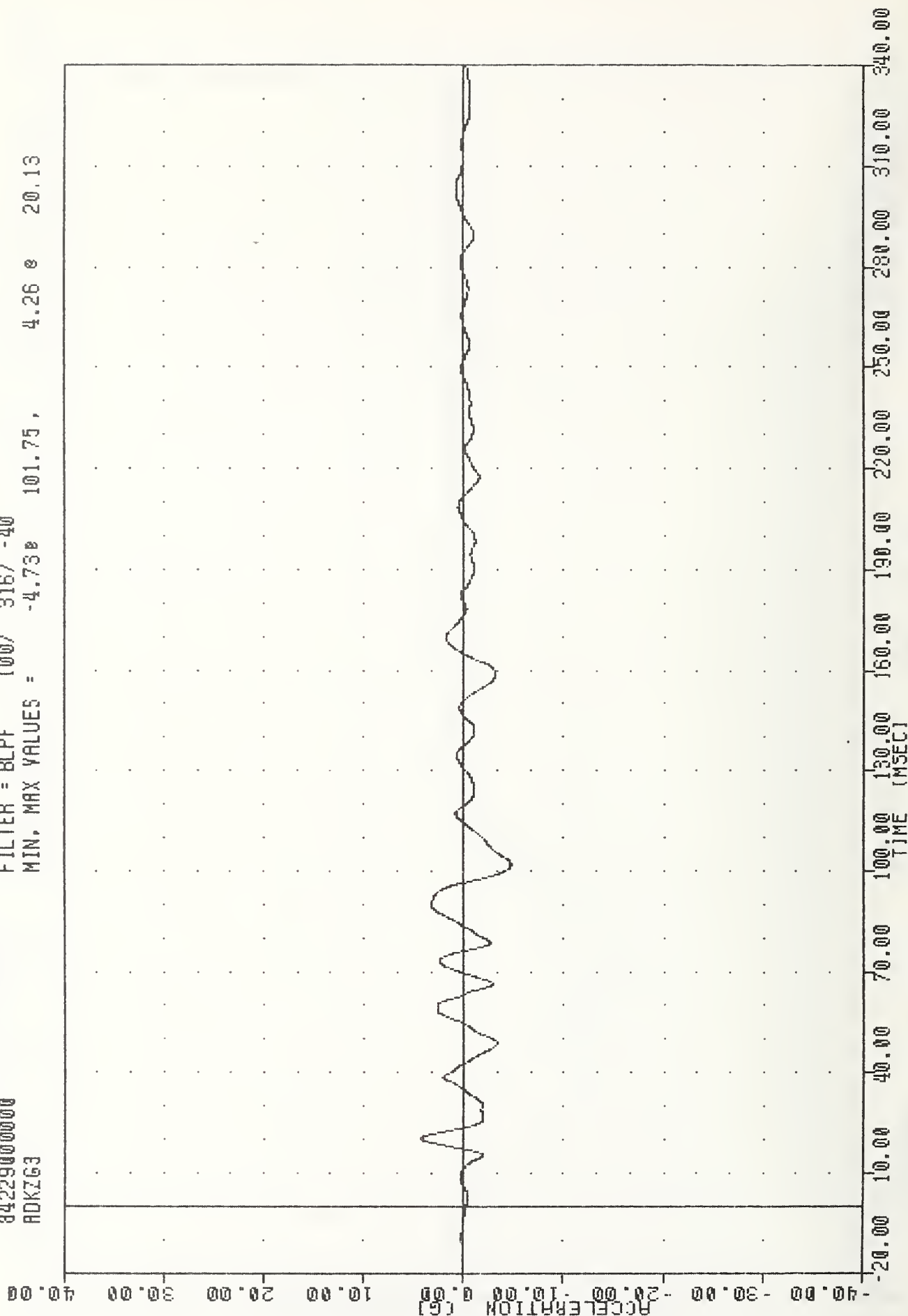
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE REAR DECK ACCELERATION Y AXIS

TRC , 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
ADKZG3

PLOT DATE 24-AUG-84 08:25:57

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -4.73e 101.75, 4.26 e 20.13



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45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE REAR DECK ACCELERATION Z AXIS

TRC , 840816 PLOT DATE 24-AUG-84 08:27:03

SIDE AGGRESSIVE ATTRIBUTES

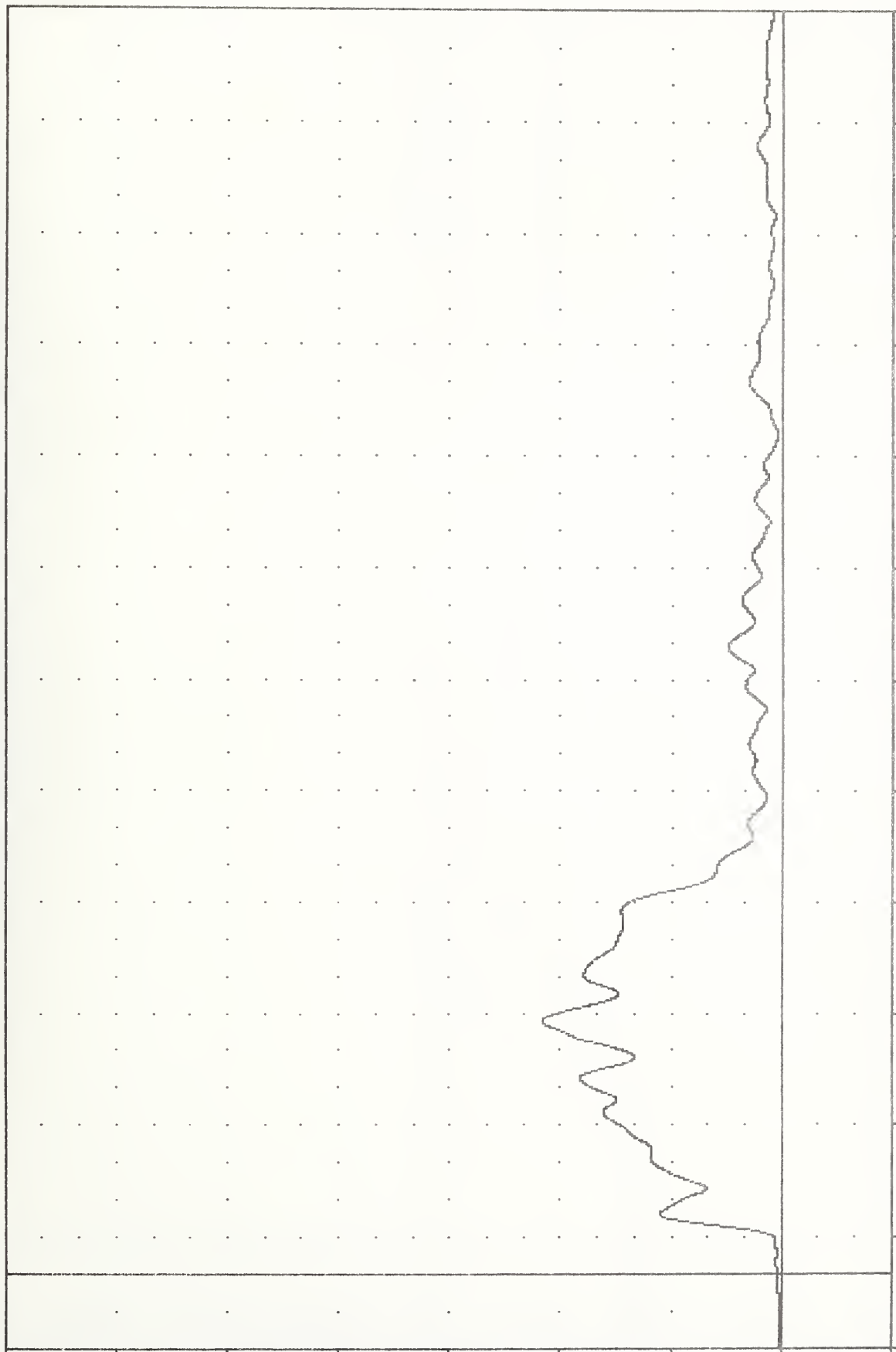
84229000000

ADKRG3

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.11e -15.50, 21.65 e 67.75

ACCELERATION (G)



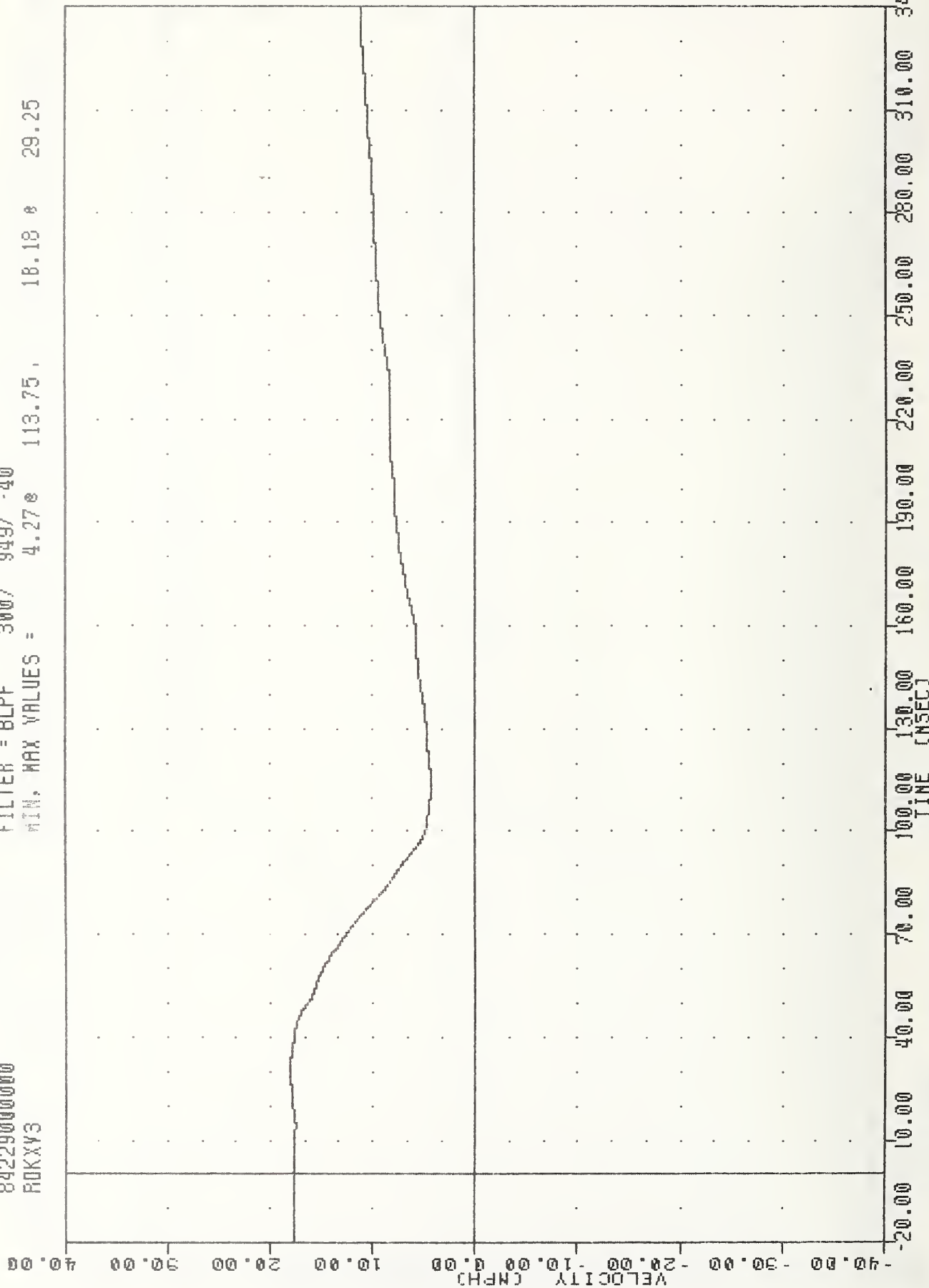
-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00

0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE REAR DECK RESULTANT

TIDC 00810
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 ROKXV3

PLU, DAIL 24 1106-04 11.31:20
 FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 4.278 113.75, 18.18 29.25



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING ROKXG3

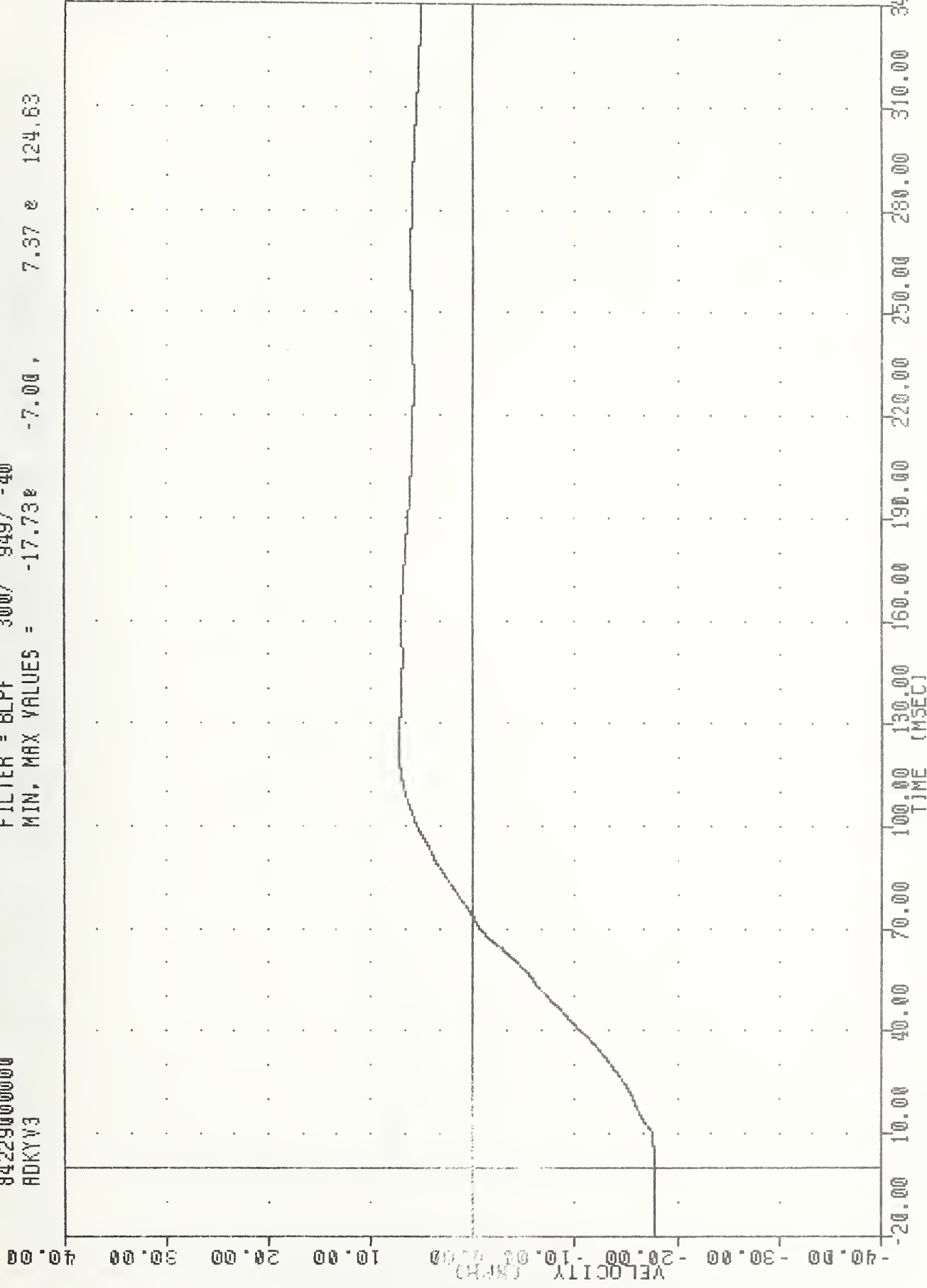
```

FLOW DATE      27 AUG 67      11:31:20
FILTER = BLPF      300/      949/ -40
MIN. MAX VALUES = -17.730 -

```

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -17.73e

7.00' 7.37' 124.63'



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA W USING RDKYG3

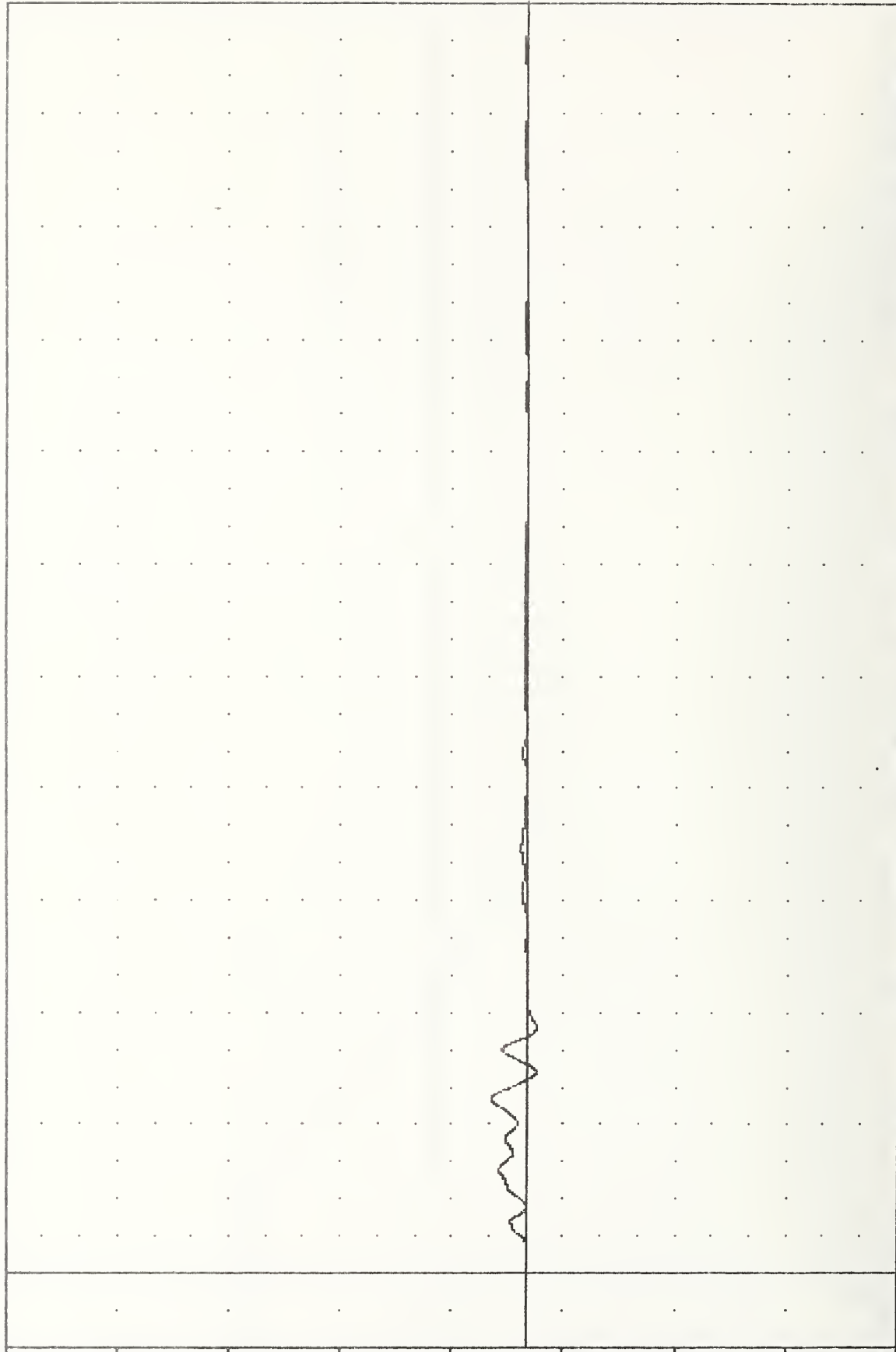
TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LRSYG4

PLOT DATE 24-AUG-84 08:25:57

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -11.25e 65.75, 38.64 e 46.88

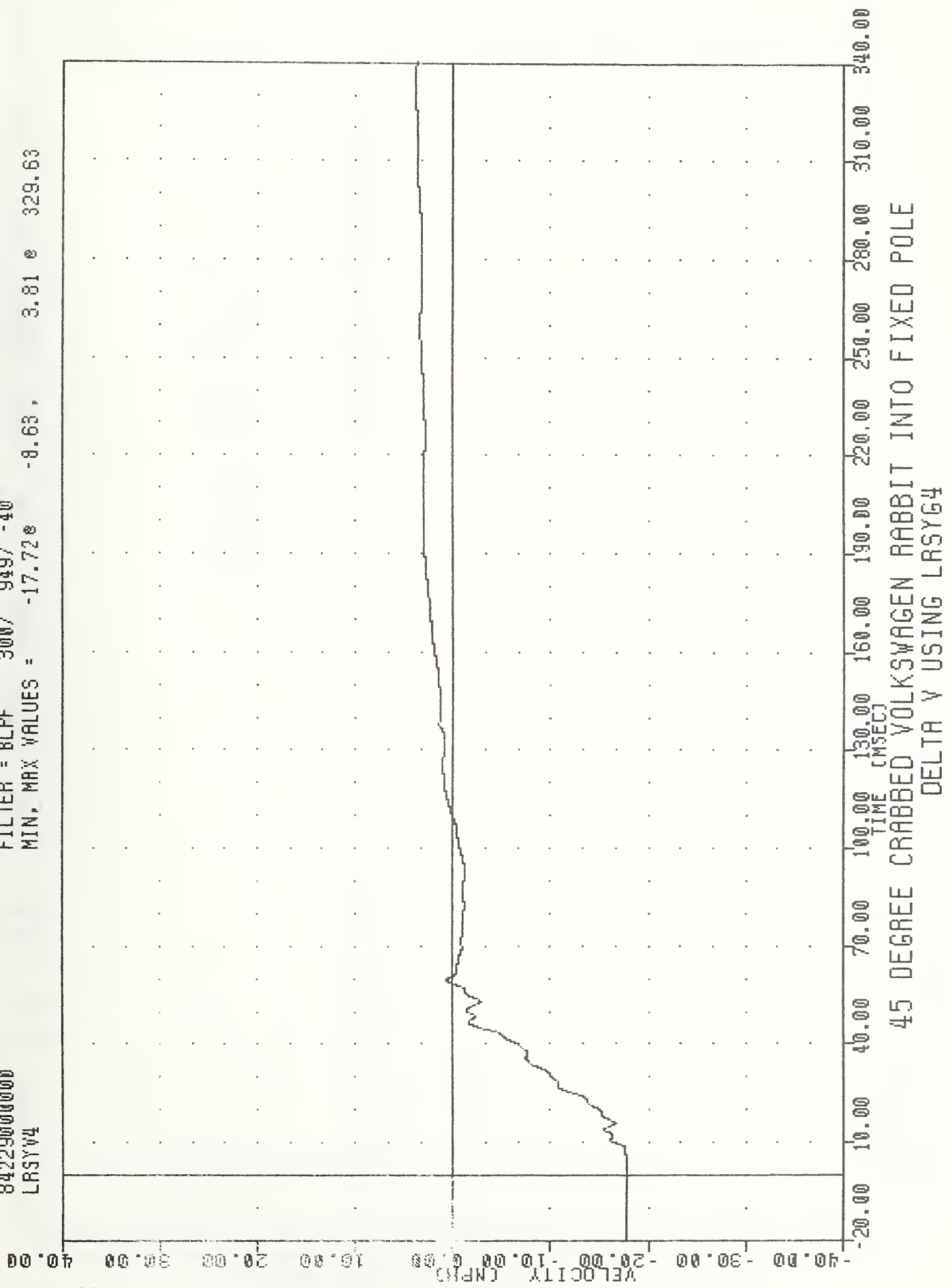
ACCELERATION (G) (X10⁴)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE LEFT REAR SILL ACCELERATION Y AXIS

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LRSYV4
 PLU1 DATE 24-HUG-84 11:31:20
 FILTER = 8LPF 300/ 949/ -40
 MIN. MAX VALUES = -17.720 -8.63 , 3.81 0 329.63



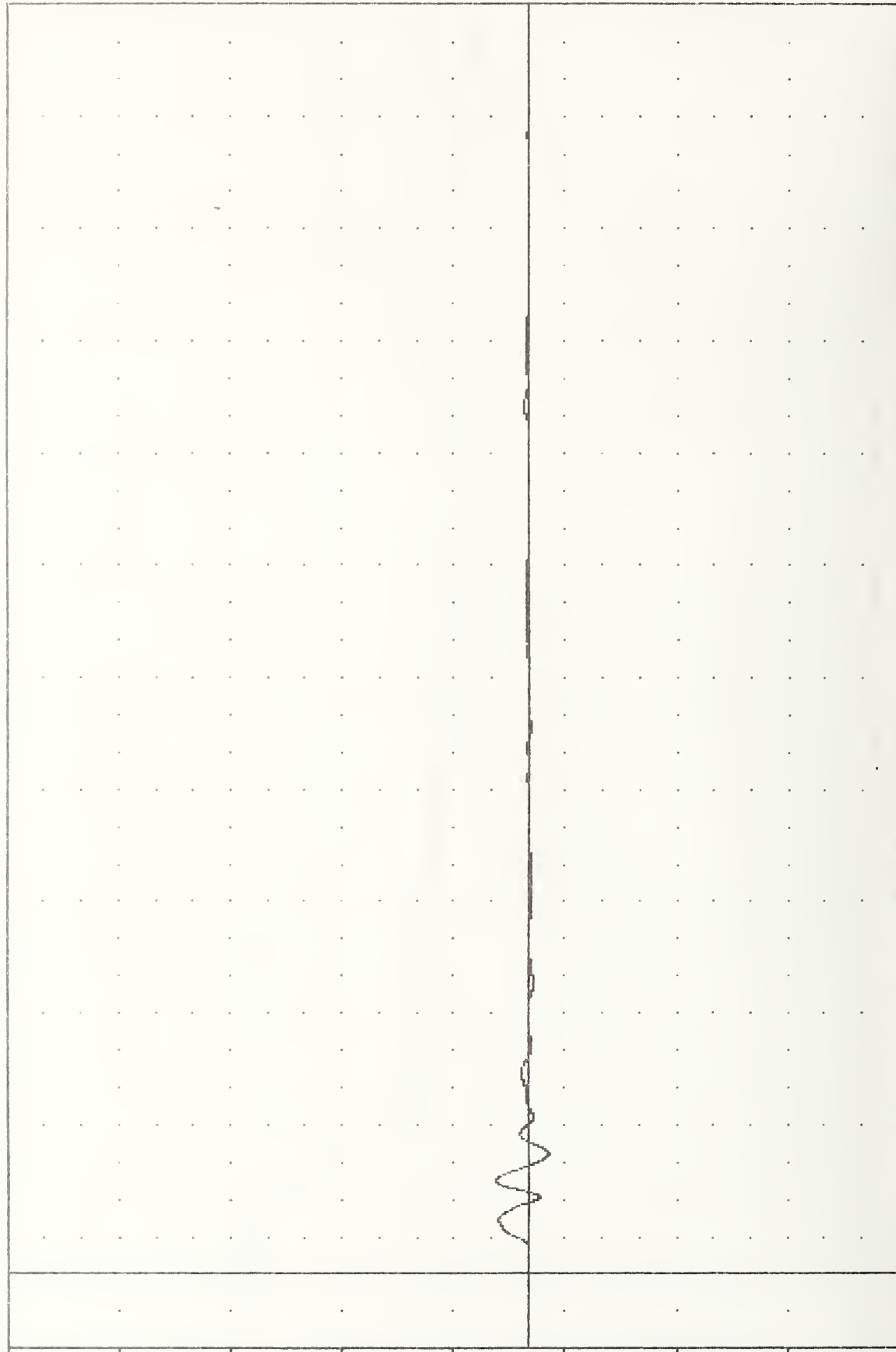
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LRSYG4

TAC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LFSY65

PLOT DATE 24-AUG-84 08:25:57

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -22.498 32.25 , 34.40 e 24.88

ACCELERATION (G) (X10⁴)



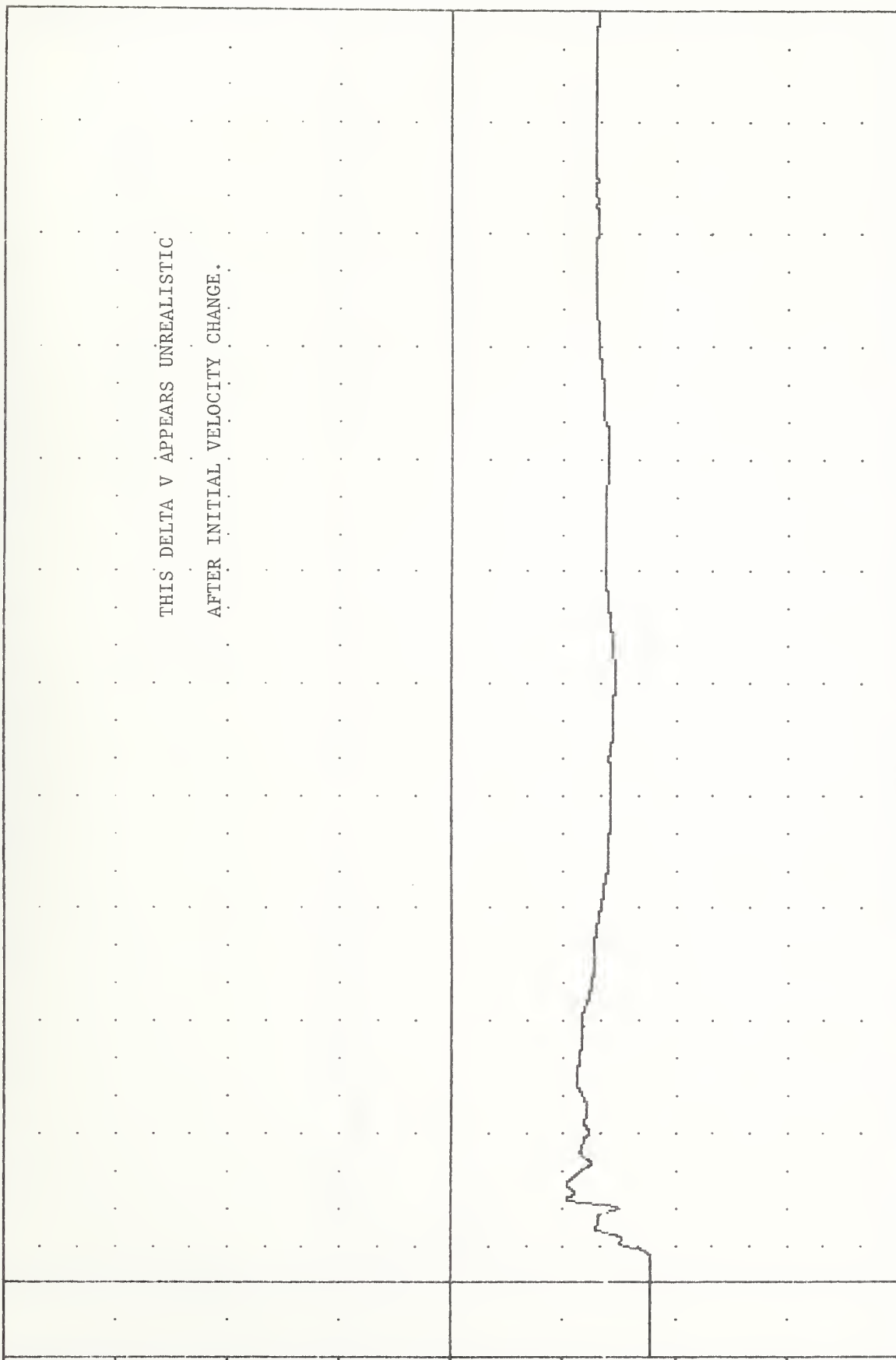
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

INL 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LFSYG5

PLU1 DATE 24-HUG-84 11:31:20
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -17.77 6.75, -10.30 22.25

40.00
 30.00
 20.00
 10.00
 0.00
 -10.00
 -20.00
 -30.00
 -40.00

B-91



THIS DELTA V APPEARS UNREALISTIC
 AFTER INITIAL VELOCITY CHANGE.

-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

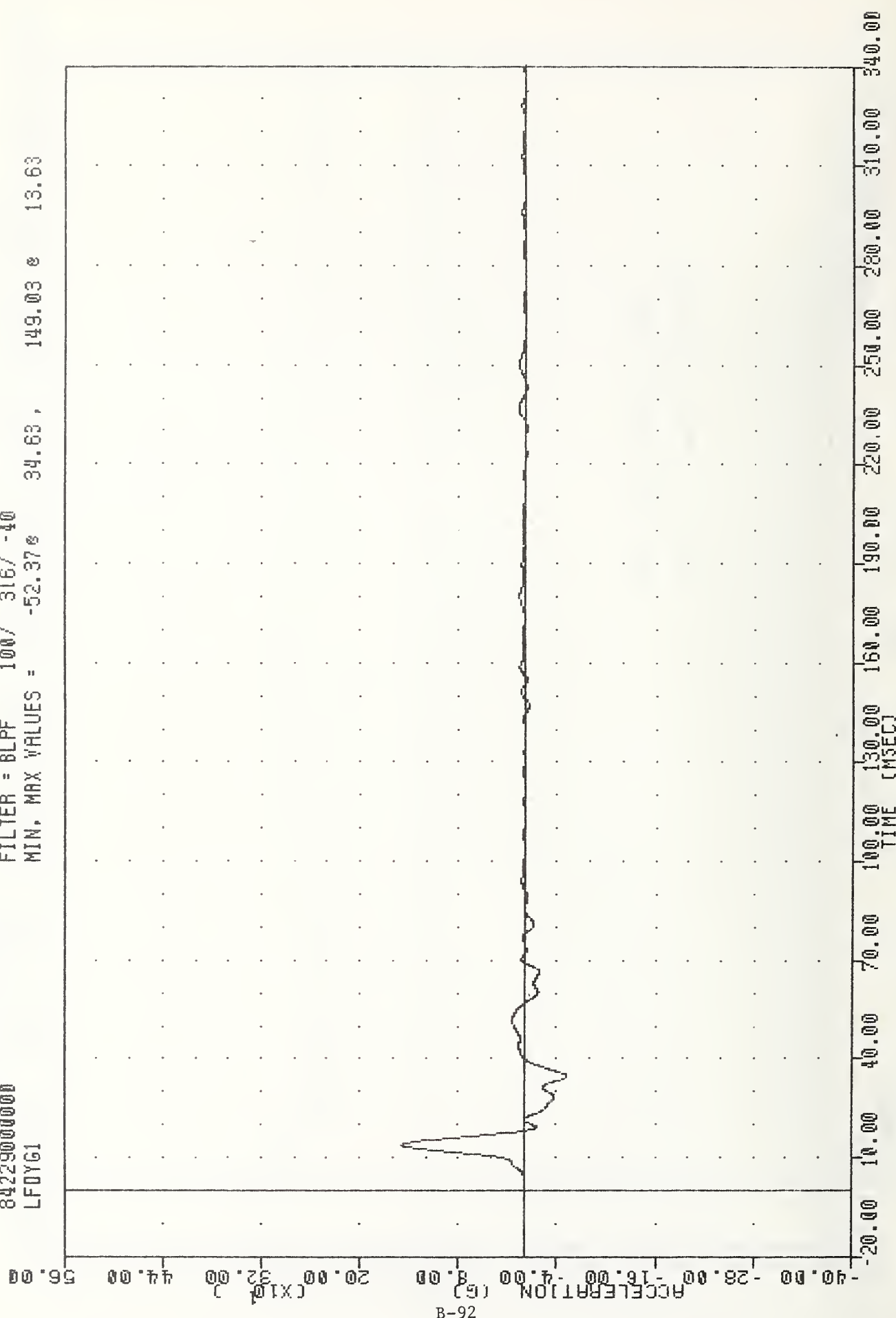
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LFSYG5

TRC , 840816
SIDE AGGRESSIVE ATTRIBUTES
842290000000
LF0Y61

PLOT DATE 24-AUG-84 08:25:57

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -52.37 34.63, 149.03 13.63



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

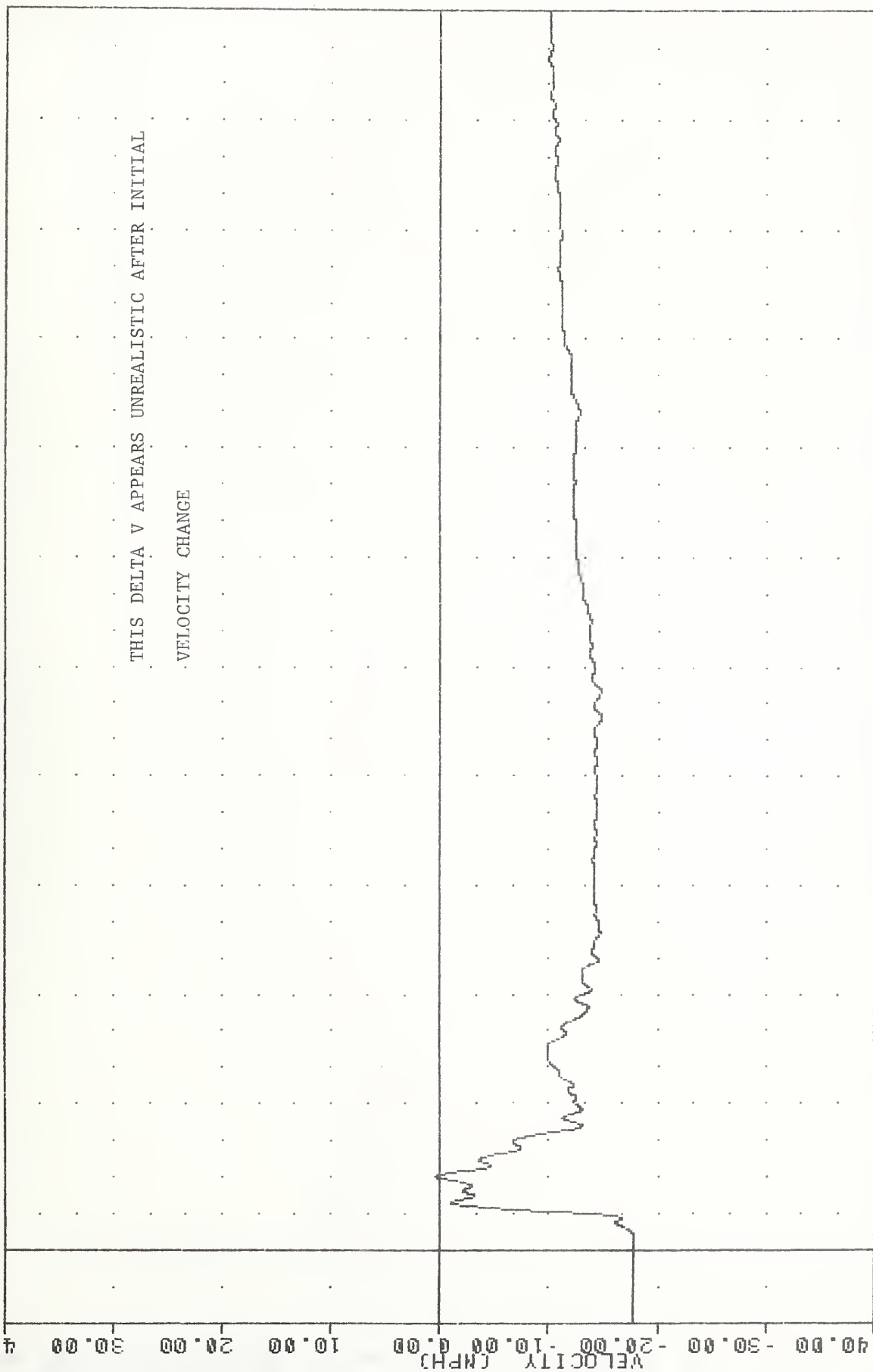
INC 04W010
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LFDYV1

FLUJ UNIC 24-NUV-04 11-01-20

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -17.85e 2.25, 0.38 e 20.00

40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00

B-93



20.00 10.00 0.00 10.00 20.00 30.00 40.00
TIME (MSEC) 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

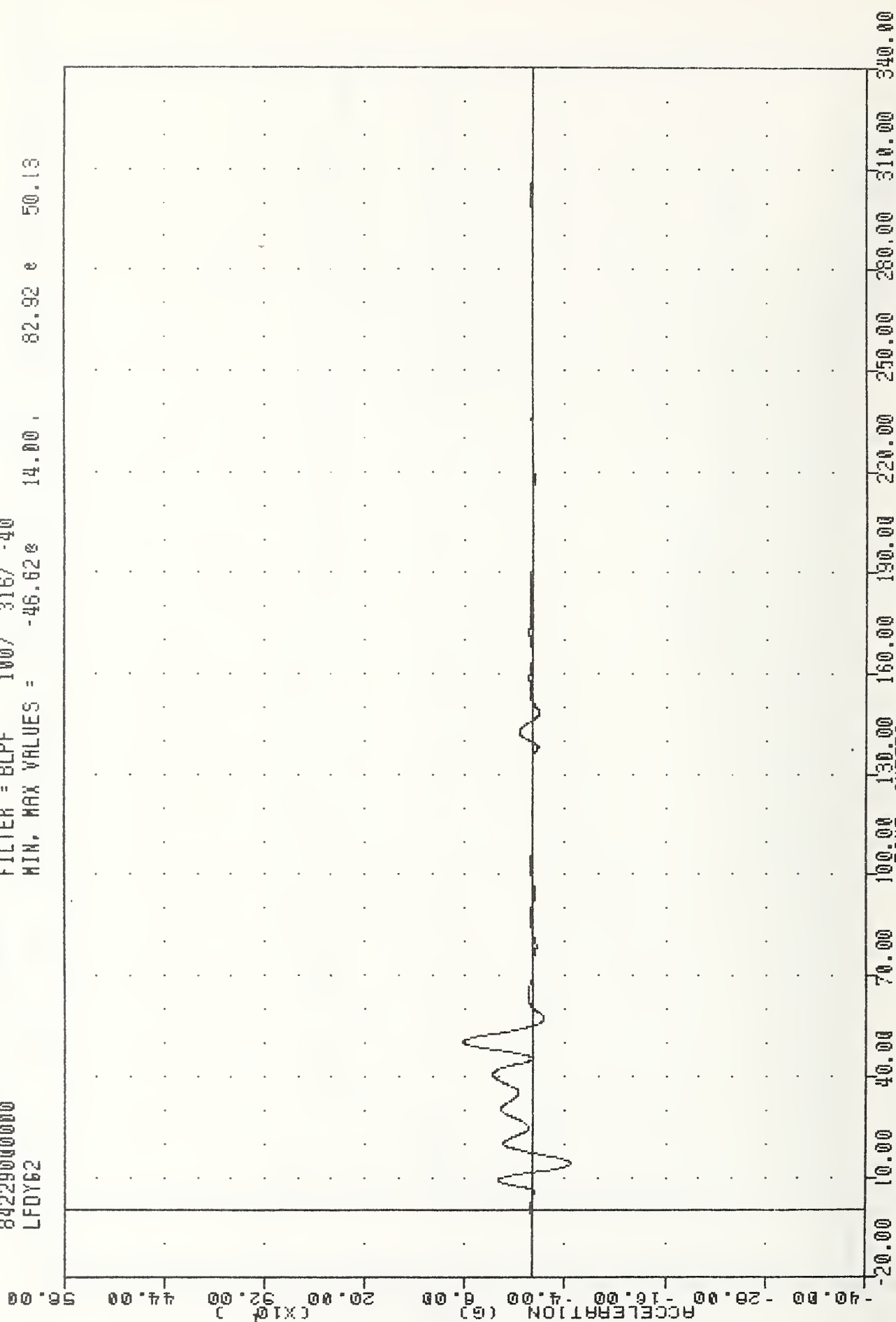
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LFDYV1

TRC 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LFDY62

PLOT DATE 24-AUG-84 08:25:57

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -46.62 14.00 82.92 50.13



B-94

45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

FILE 040010

SIDE AGGRESSIVE ATTRIBUTES

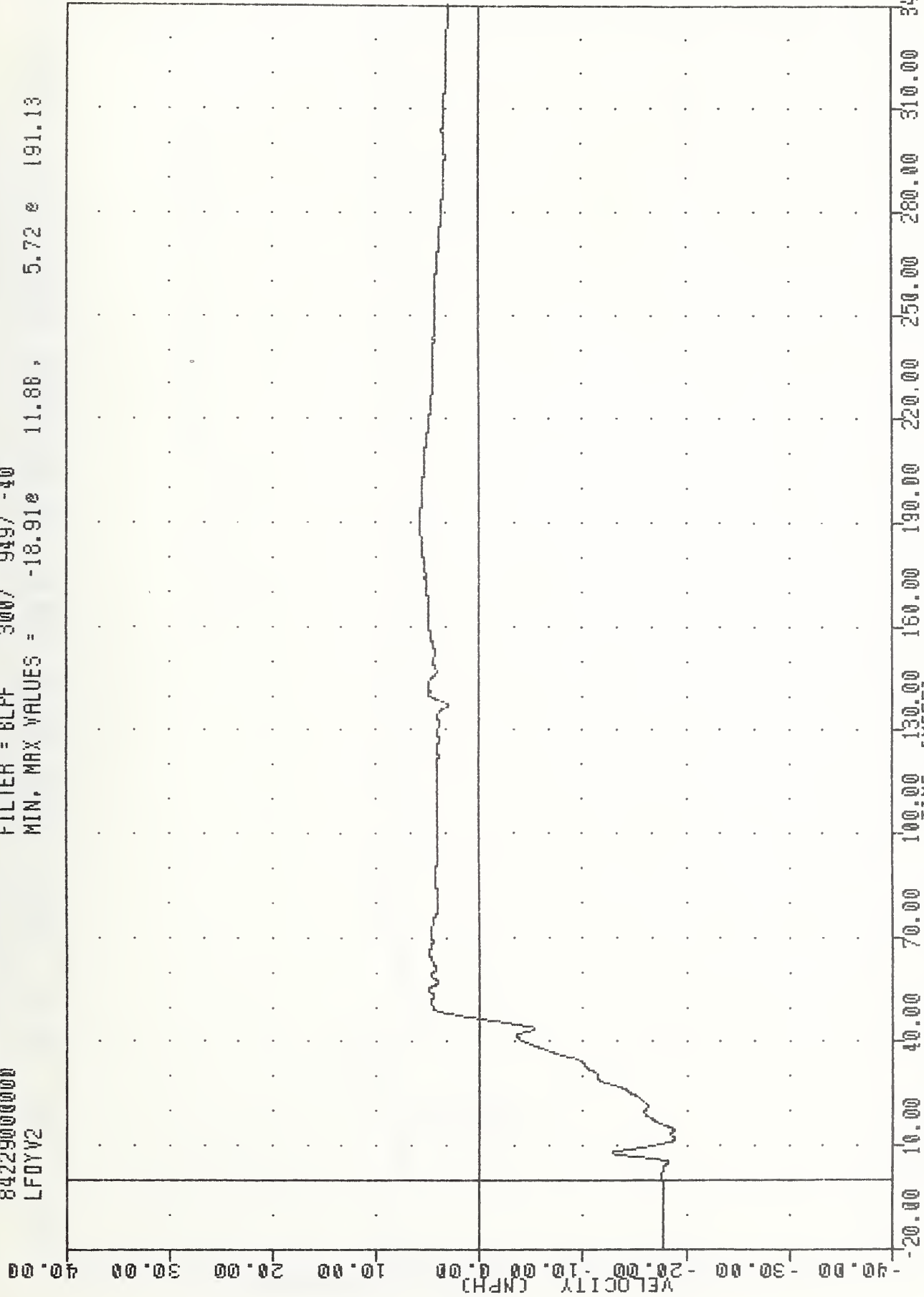
84229000000

LFDYV2

FLUJ UNIC 24-MOV-04 11-01-20

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -18.910 11.86, 5.72 @ 191.13



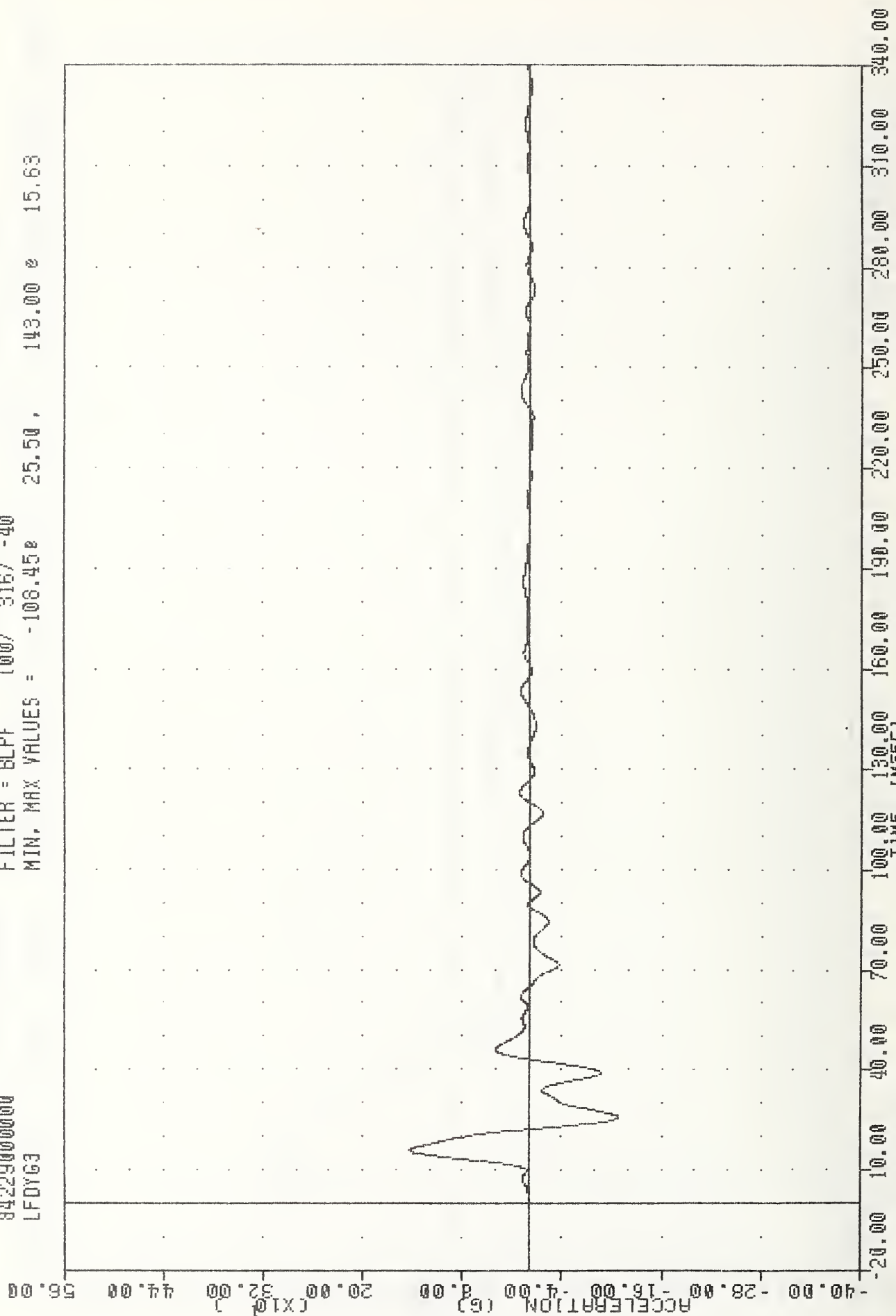
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE

DELTA V USING LFDY62

PLU1 UNIT 24-HUG-84 08:20:57

IRC 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LFDY63

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -108.450 25.50, 143.00 0 15.63



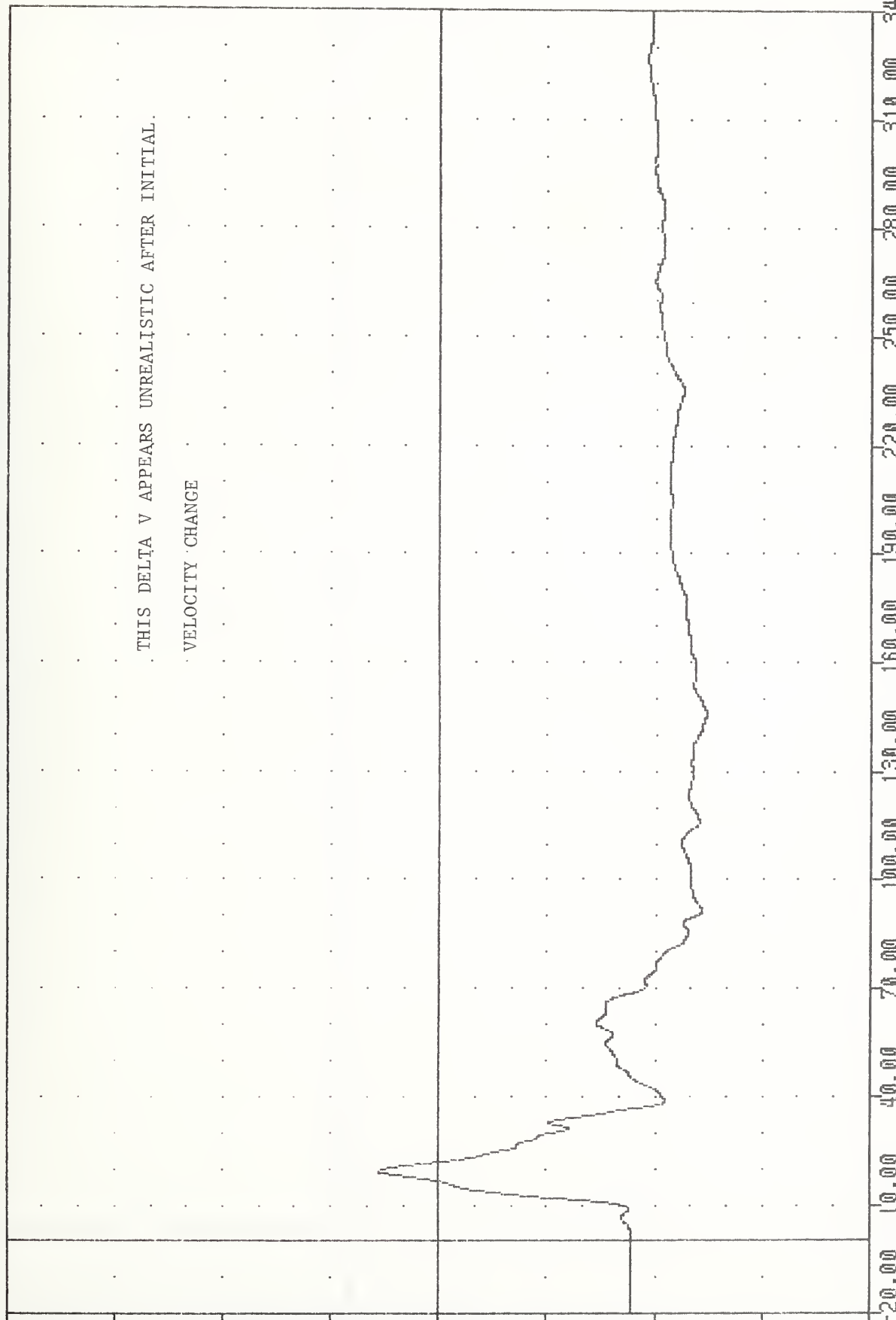
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE LEFT FRONT DOOR (POSITION 9) ACCELERATION Y AXIS

TML 040810
SIDE AGGRESSIVE ATTRIBUTES
84229000000
LFDYV3

PLU1 DRIC 24-nUG-04 11.3112W

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -24.730 145.50, 5.59 e 19.13

VELOCITY (CMPS)

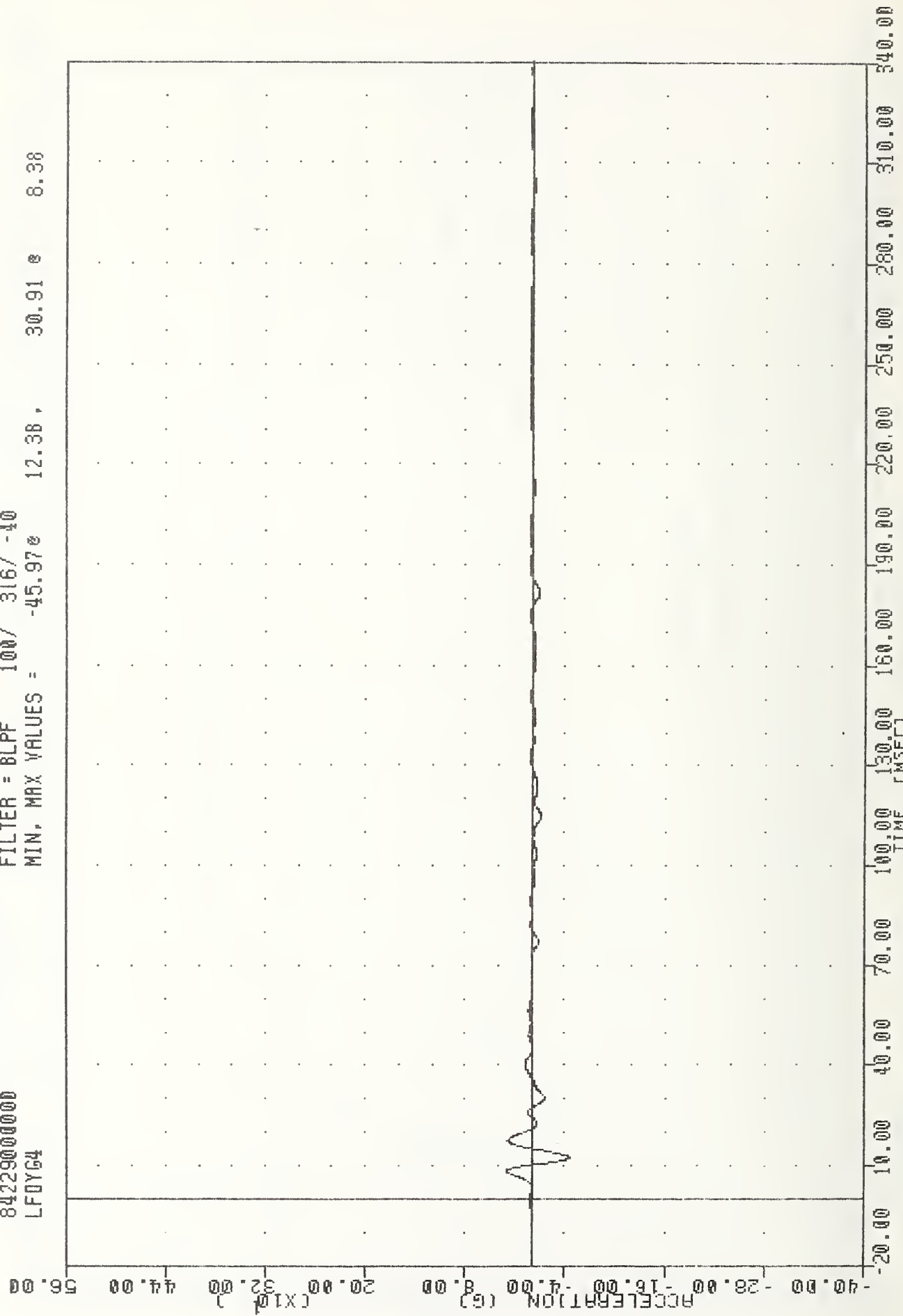


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
DELTA V USING LFDYV3

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 842290000000
 LFOY64

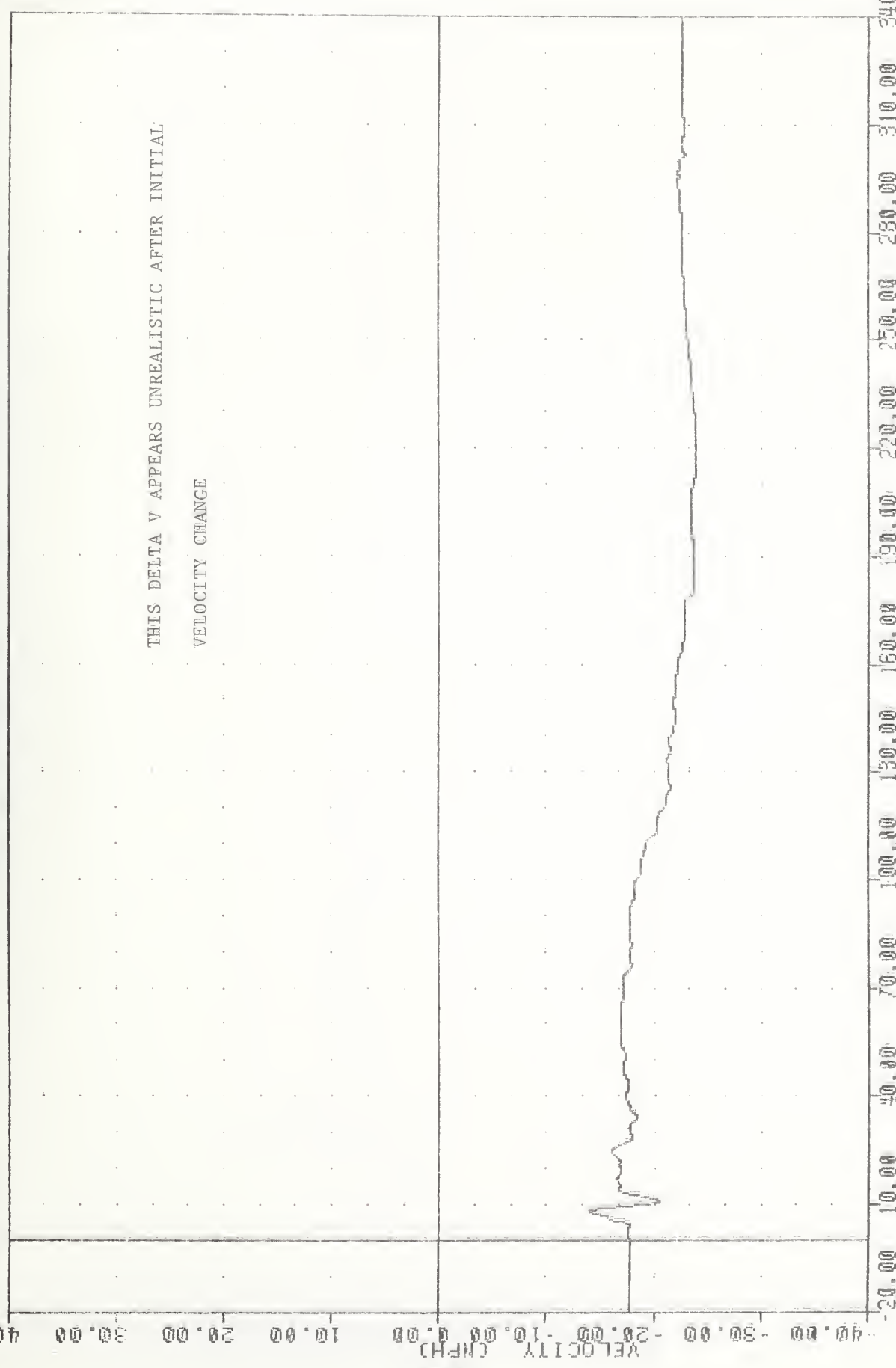
PLOT DATE 24-AUG-84 08:25:57

FILTER = 8LPF 100/ 316/ -10
 MIN, MAX VALUES = -45.970 12.36, 30.91 8.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 LFOYV4
 PLOT DATE 24-HUG-84 11:31:20
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -23.97e 227.13, -13.92 e 7.88



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LFOYV4

TAC , 840816 PLOT DATE 24-AUG-84 08:25:57

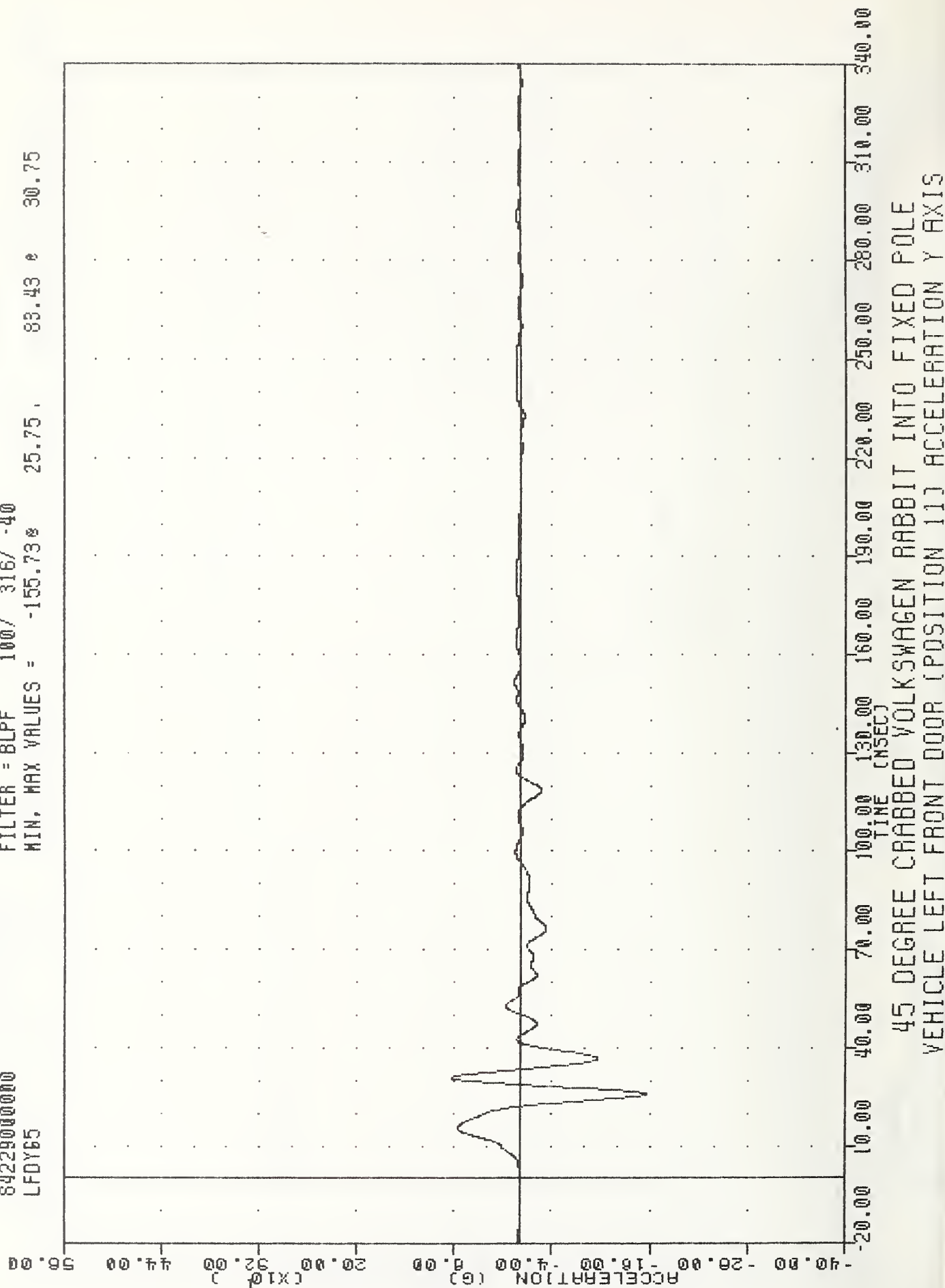
SIDE AGGRESSIVE ATTRIBUTES

842290000000

LFDY65

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -155.73 25.75 83.43 30.75

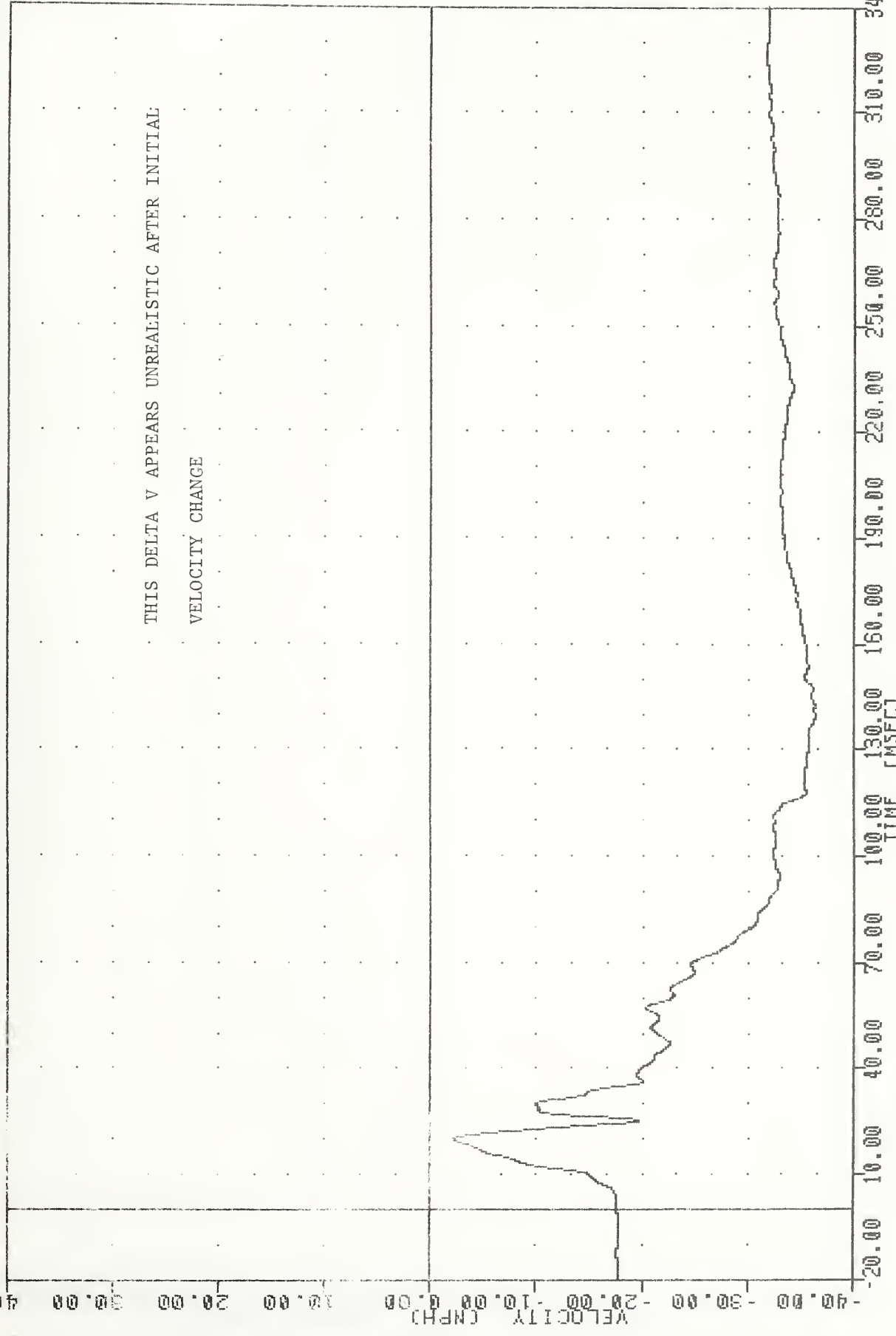


10-0400810
 8100 AGGRESSIVE ATTRIBUTES
 84220004008
 LFOYV6

Plot DRIL 2* 106-04 11-31:20

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -36.39% 139.50, -2.05 % 19.88



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 DELTA V USING LFOYV65

TRC , 840816 PLOT DATE 24-AUG-84 08:25:57

SIDE AGGRESSIVE ATTRIBUTES

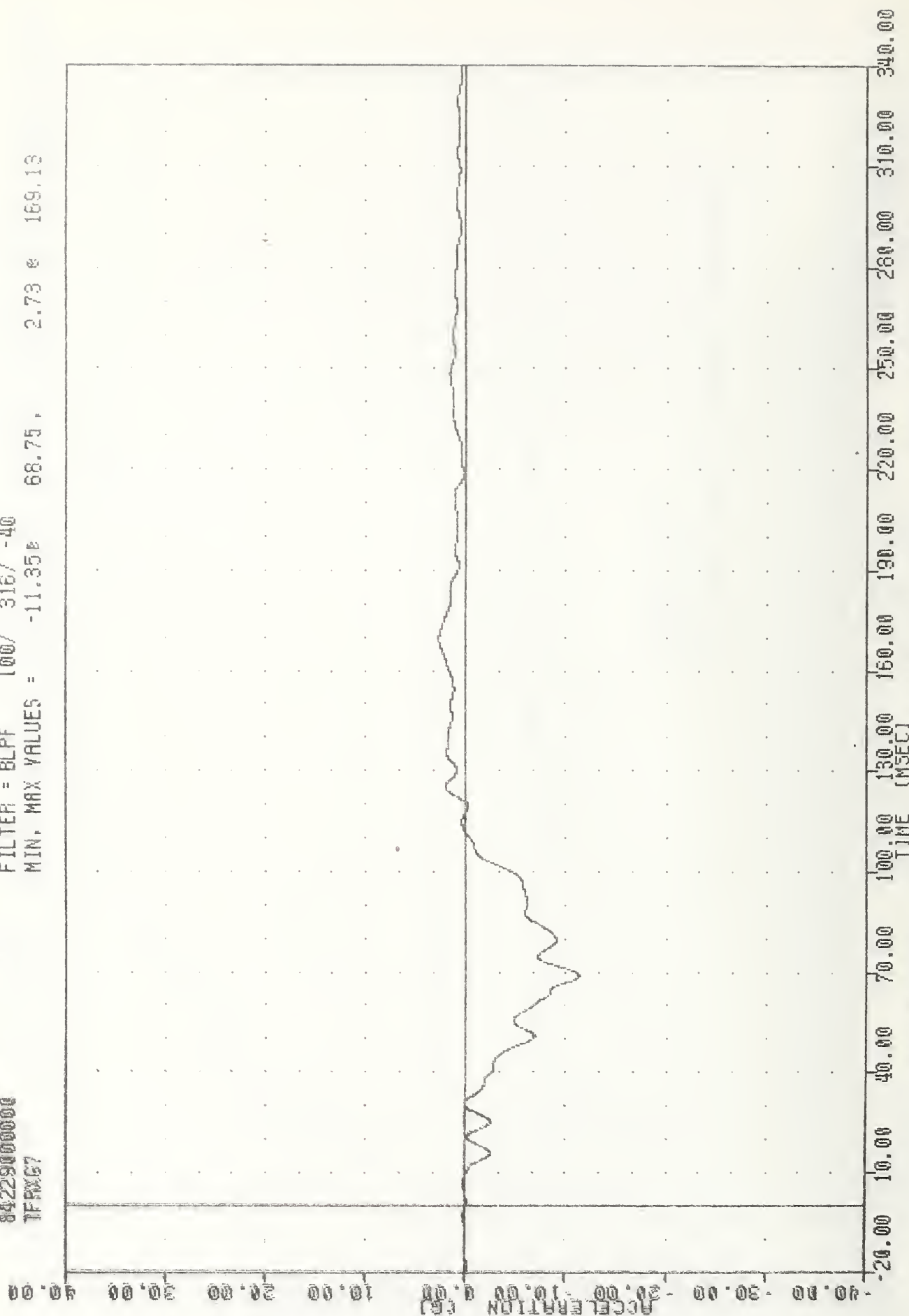
84229000000

TRFMS7

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -11.35 68.75,

2.73 169.13



B-102

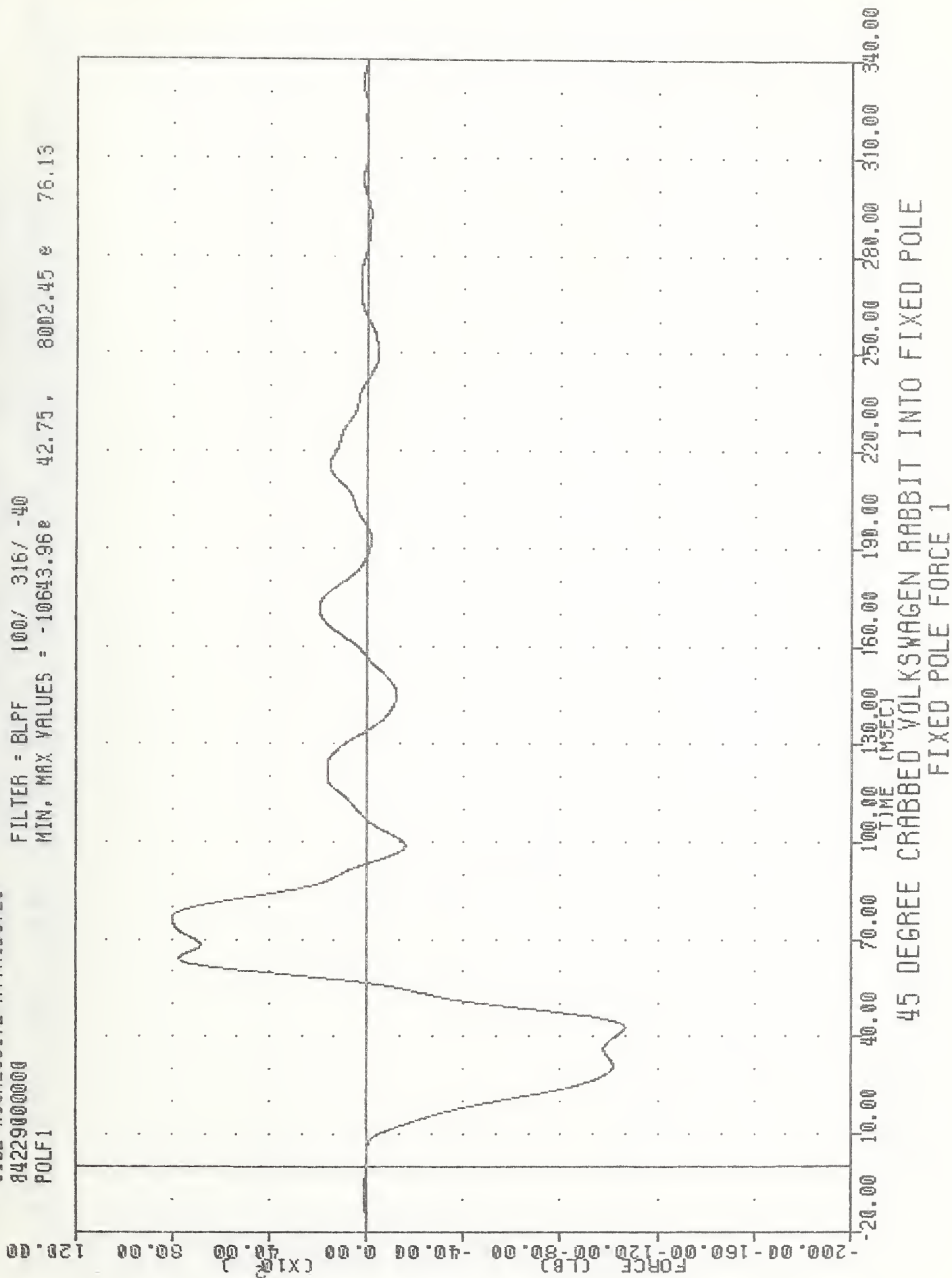
45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
VEHICLE TRUNK FLOOR RIGHT ACCELERATION X AXIS

TRC , 840816
SIDE AGGRESSIVE ATTRIBUTES
84229000000
POLF1

PLOT DATE 19-SEP-84 09:59:59

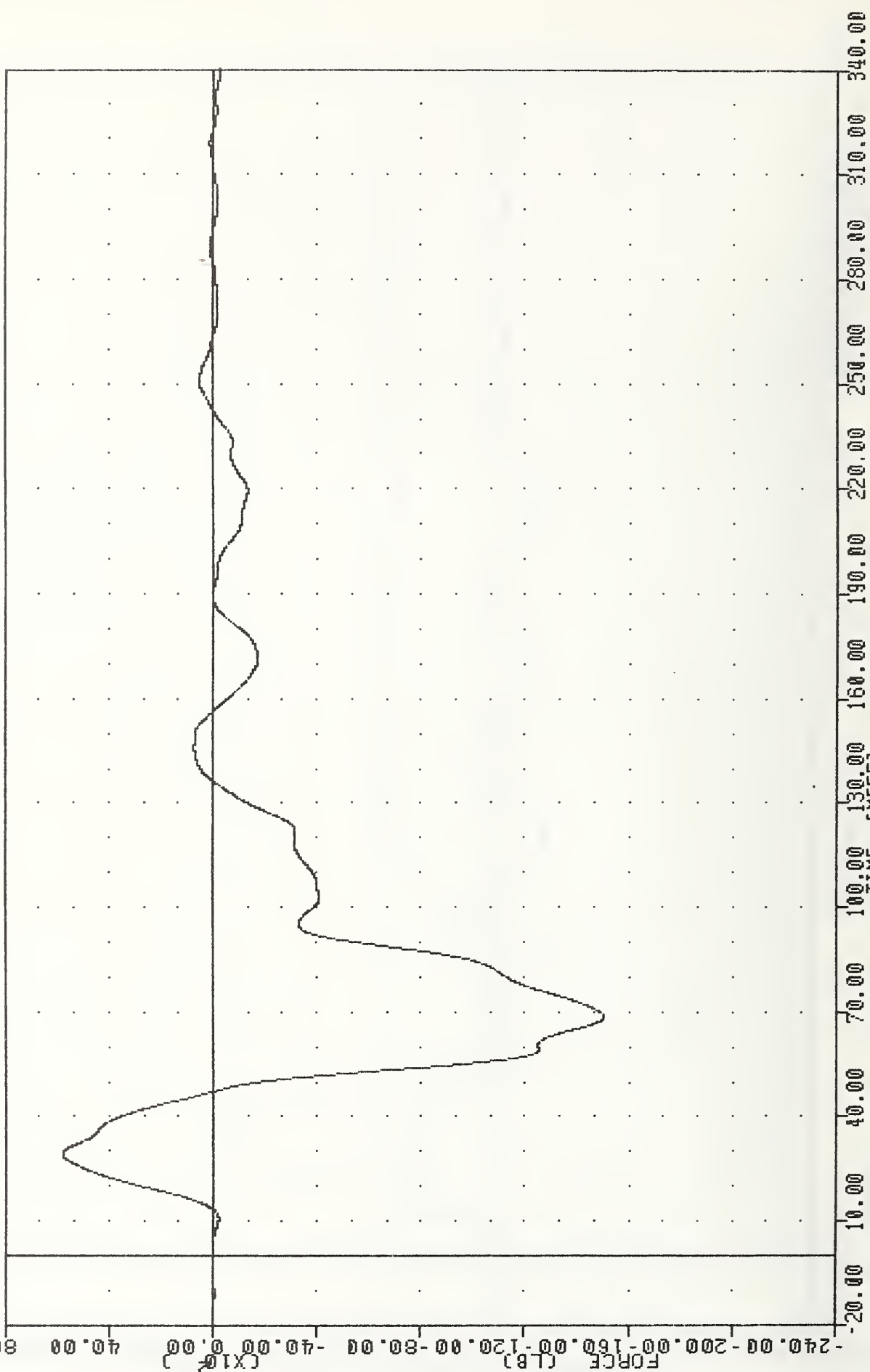
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -10643.96e 42.75, 8002.45 e 76.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
FIXED POLE FORCE 1

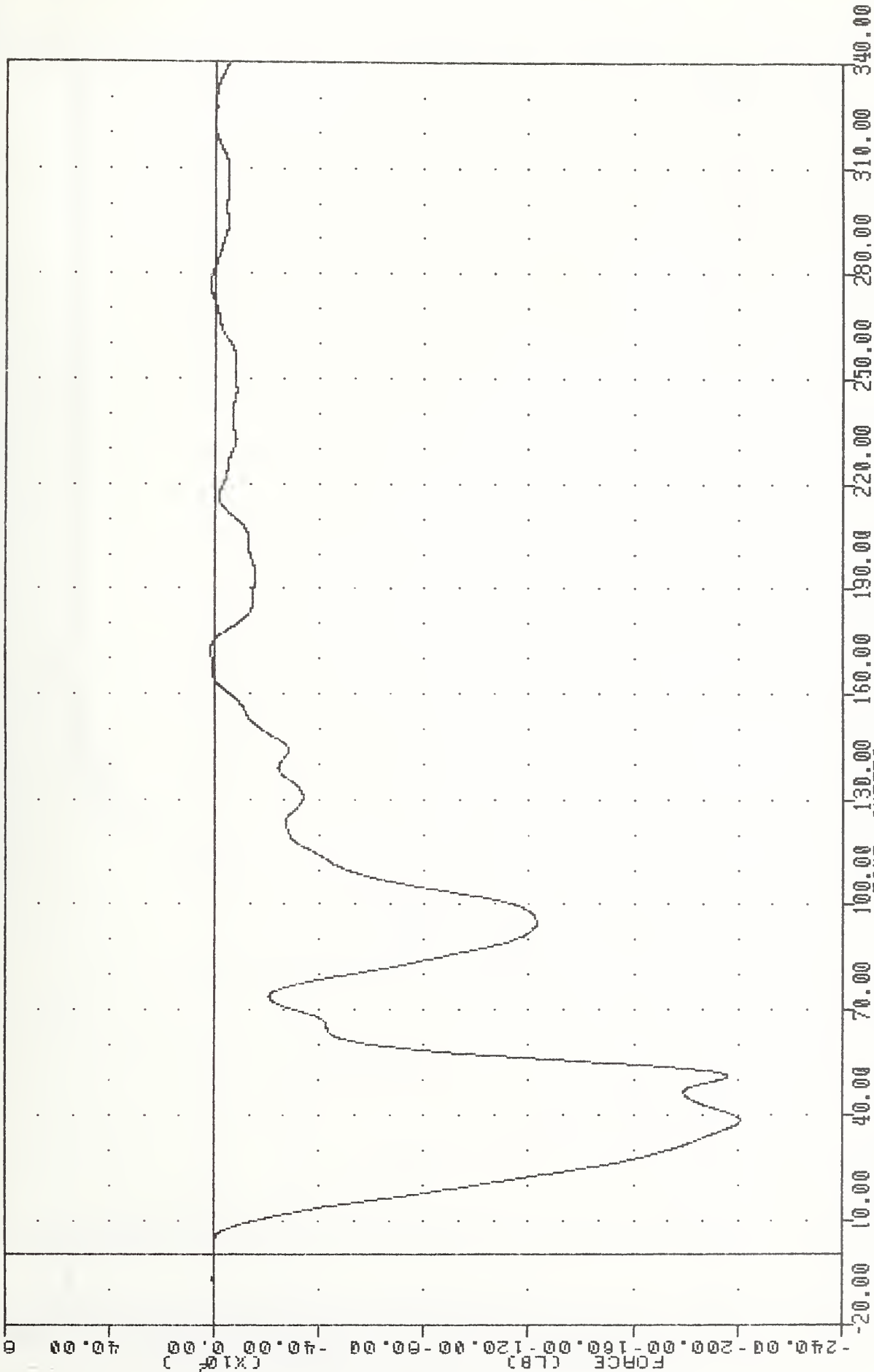
TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 POLF2
 PLOT DATE 24-AUG-84 08:25:57
 FILTER = 8LPF 100/ 316/ -40
 MIN. MAX VALUES = -15038.080 68.50 , 5790.47 0 29.13



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 FIXED POLE FORCE 2

TAC 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 PULF3

PLOT DATE 24-AUG-84 08:25:57
 FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -20076.660 38.25, 203.82 & 277.13

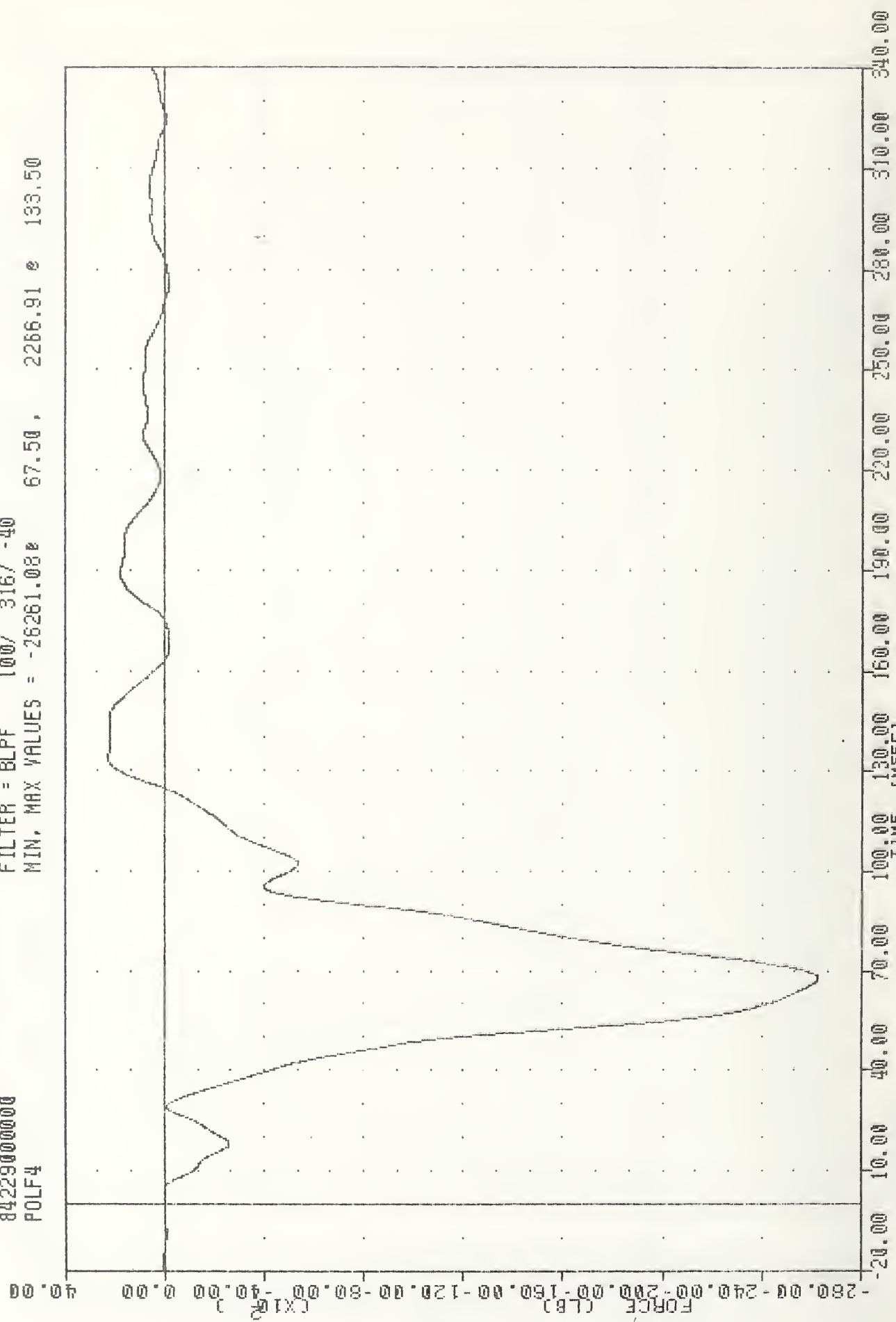


45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 FIXED POLE FORCE 3

TRC , 840816
 SIDE AGGRESSIVE ATTRIBUTES
 84229000000
 POLF4

PLOT DATE 11-SEP-84 08:50:59

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -26261.08e 67.50 , 2266.91 e 133.50



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
 FIXED POLE FORCE 4

IRC , 840816 PLOT DATE 11-SEP-84 08:50:59

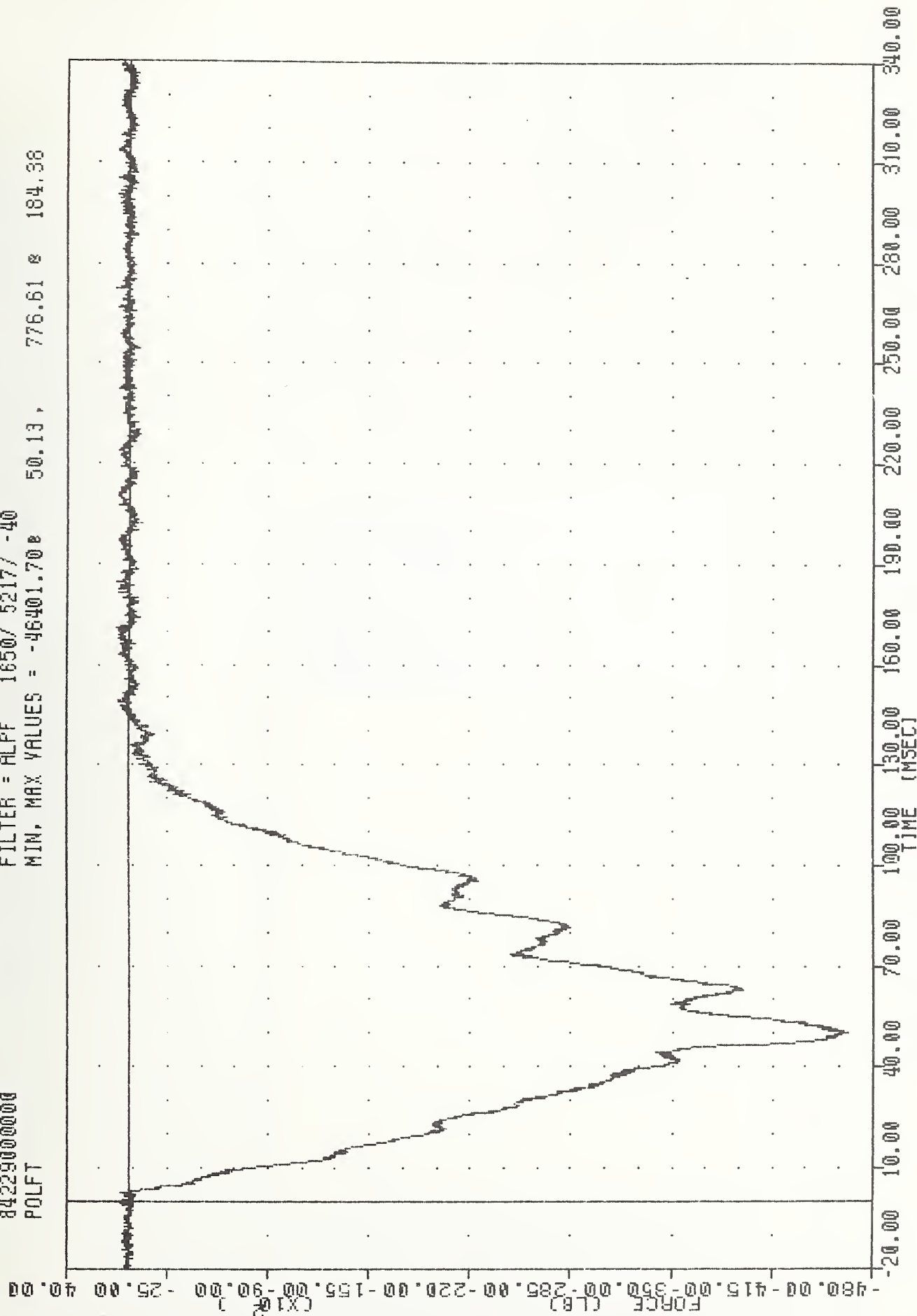
SIDE AGGRESSIVE ATTRIBUTES

84229000000

POLFT

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -46401.70e 50.13, 776.61 e 184.38



45 DEGREE CRABBED VOLKSWAGEN RABBIT INTO FIXED POLE
TOTAL OF FOUR POLE FORCES

TL 242 .B452

Bell, L. 192

Side-impact
attributes

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